



Commercial Air Conditioning

SERVICE MANUAL



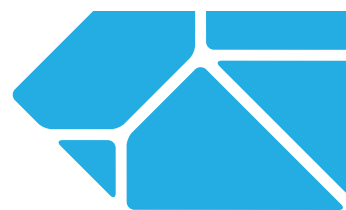
3U24GS1ERE



4U36GS1ERE

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1. Specification

item		model		3U24GS1ERE	
Function			—	Cooling	Heating
Rated capacity			BTU	22000	22600
Rated power input (indoor + outdoor)			W	2200	1980
Rated current input (indoor + outdoor)			A	9.6	8.6
EER			BTU/W	10.0	
SEER / HSPF			BTU/W	16.0	8.5
Minimum capacity			BTU	5000	6000
Minimum power input			W	550	550
Maximum capacity			BTU	25000	30000
Maximum power input (indoor + outdoor)			W	3100	3100
Power source			—	1PH, 208/230V~, 60Hz	
Max.Running current (indoor + outdoor)			A / A	13.5	13.5
Fuse size (recommended size)			A	25	
Outdoor unit	Compressor	Comp Model	—	SNB172FJGMC	
		Oil charge and type	—	600CC, FV 50S	
		Type	—	Twin Rotary (DC inverter)	
		Number	—	1	
	Fan	Type × Number	—	Axial × 1	
		Speed	r/min	High 820	
		Motor output/input power	W	80/100	
		Air-flows (H/M/L)	CFM(m³/h)	about 1470 (2500)	
	Heat exchanger	Type / Diameter	in(mm)	TP2M /0.31(7.94)	
		row	—	2	
		Face area	in²(m²)	about 5.6 (0.52)	
	Dimension (WxDxH)	External	in(mm)	37/13.6/28.7(940/345/730)	
		Package	in(mm)	39.6/16.7/32(1005/423/815)	
	Refrigerant control method		—	PMVs	
	Defrosting method/		—	Automatic by reversible cycle	
	Crankcase heater power		W	NONE	
	Noise level	Sound pressure level	dB(A)	54	
	Weight	Net / Shipping	lb (kg)	117(53)/123(56)	
Piping	Refrigerant	Type / Charge	OZ(kg)	R410A / 74 (2.1)	
		No need to recharge	ft(m)	98.4(30)	
		Recharge	OZ/ft(g/m)	0.2(20)	
	Pipe	Liquid	in(mm)	3" Φ1/4(6.35)	
		Gas	in(mm)	3" Φ3/8(9.52)	
	Connecting method		—	Flared	
	Between I.D & O.D	Drop between IU & OU	ft(m)	≤ 24.6ft(7.5m)	
		Piping length between IU & OU	ft(m)	≤ 32.8ft(10m)	
		Total liquid piping length	ft(m)	≤ 98.4ft(30m)	
		Drop between indoor units	ft(m)	≤ 3.3ft(1m)	
		Max.Drop between IU & OU	ft(m)	50ft(15m)(indoor unit lower than outdoor unit)	
		Max.Drop between IU & IU	ft(m)	50ft(15m)(indoor unit higher than outdoor unit)	
		Max.Drop between indoor units	ft(m)	16.5ft(5m)	
		Max.Piping length between IU & OU	ft(m)	82ft(25m)	
		Max.Total length	ft(m)	197ft(60m)	
working temperature	Cooling		°F (°C)	14-115(-10~46)	
	Heating		°F (°C)	5-75(-15~24)	

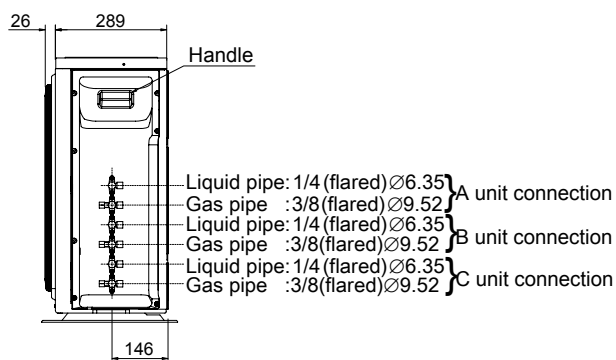
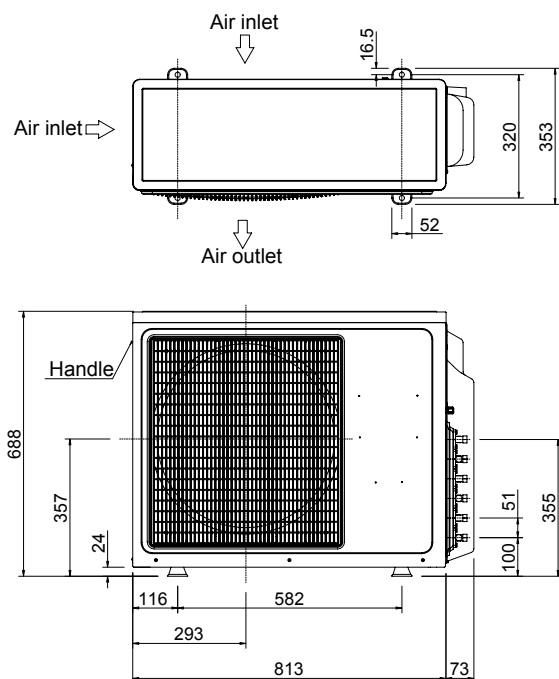
1. The above performance data are from the combination of 3U24GS1ERE+3*HSU109VHG-G.

2. Large drop and long piping installation will obviously reduce the total capacity.

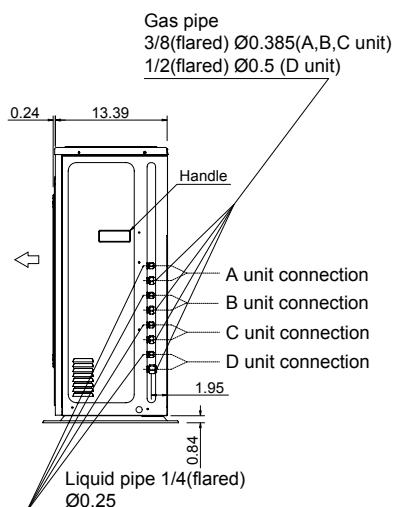
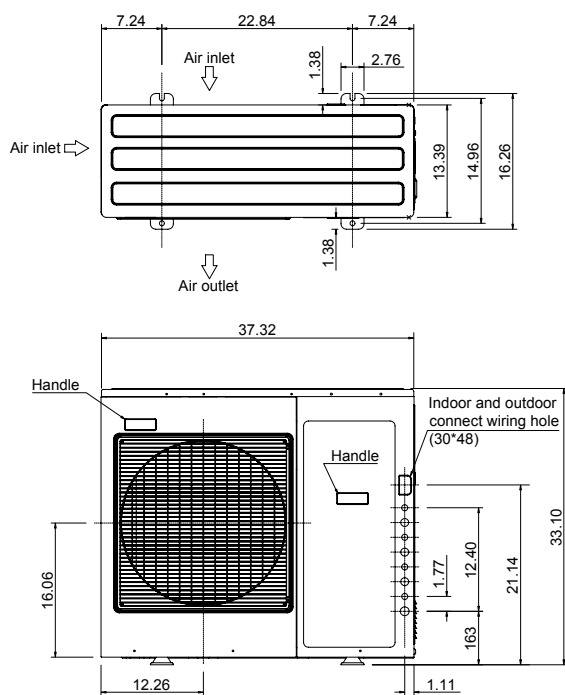
Item			Model	4U36HS1ERE	
Function			——	Cooling	Heating
Rating capacity			BTU	31600	34000
Rated power input (indoor + outdoor)			W	3370	3250
Rated current input (indoor + outdoor)			A	14.7	14.1
EER			BTU/W	9.4	
SEER / HSPF			BTU/W	15.5	9
Minimum capacity			BTU	5000	6100
Minimum power input			W	550	550
Maximum capacity			BTU	33400	35000
Maximum power input (indoor + outdoor)			W	3800	3800
Power source			——	1PH, 208/230V~, 60Hz	
Max.Running current (indoor + outdoor)			A / A	16.5	16.5
Fuse size (recommended size)			A	25	
Outdoor unit	Compressor	Model / Manufacture	——	TNB220FLHMC	
		Oil charge and type	——	870CC/ FV50S	
		Type	——	Twin Rotary (DC inverter)	
		Number	——	1	
	Fan	Type × Number	——	Axial × 1	
		Speed	r/min	High 860	
		Motor output/input power	W	100/125	
		Air-flows (H/M/L)	CFM(m³/h)	about 2059 (3500)	
	Heat exchanger	Type / Diameter	in(mm)	TP2M / 0.28 (7.0)	
		row	——	3	
		Face area	in²(m²)	about 8 (0.75)	
	Dimension (WxDxH)	External	in(mm)	37.3/13.4/33(948/340/840)	
		Package	in(mm)	41/17/39.4(1040/430/1000)	
	Refrigerant control method		——	PMVs	
	Defrosting method		——	Automatic by reversible cycle	
	Crankcase heater power/		W	NONE	
	Sound pressure level		dB(A)	56	
	Weight		Net / Shipping	lb (kg)	168(76)/192(87)
Piping	Refrigerant	Type / Charge	OZ(kg)	R410A / 113 (3.2)	
		No need to recharge	ft(m)	131(40)	
		Recharge	OZ/ft(g/m)	0.2(20)	
		Liquid	in(mm)	4* Φ1/4 (6.35)	
	Pipe	Gas	in(mm)	3* Φ3/8(9.52)+1*Φ1/2(12.7)	
		Connecting method		——	Flared
	Between I.D &O.D	Drop between IU & OU	ft(m)	≤24.6ft(7.5m)(outdoor unit is lower than anyone indoor unit)	
		Piping length between IU & OU	ft(m)	≤32.8ft(10m)	
		Total liquid piping length	ft(m)	≤131ft(40m)	
		Drop between indoor units	ft(m)	≤3.3ft(1m)	
		Max.Drop between IU &OU	ft(m)	50ft(15m)(indoor unit lower than outdoor unit)	
		Max.Drop between IU & IU	ft(m)	50ft(15m)(indoor unit higher than outdoor unit)	
		Max.Drop between indoor units	ft(m)	16.5ft(5m)	
		Max.Piping length between IU & OU	ft(m)	82ft(25m)	
Max.Total length		ft(m)	227ft(70m)		
working temperature		Cooling	°F (°C)	14-115(-10~46)	
		Heating	°F (°C)	5-75(-15~24)	
1. The above performance data are from the combination of 4U36HS1ERE+4*HSU109VHG-G.					
2. Large drop and long piping installation will obviously reduce the total capacity.					

2. Dimension

3U24GS1ERE

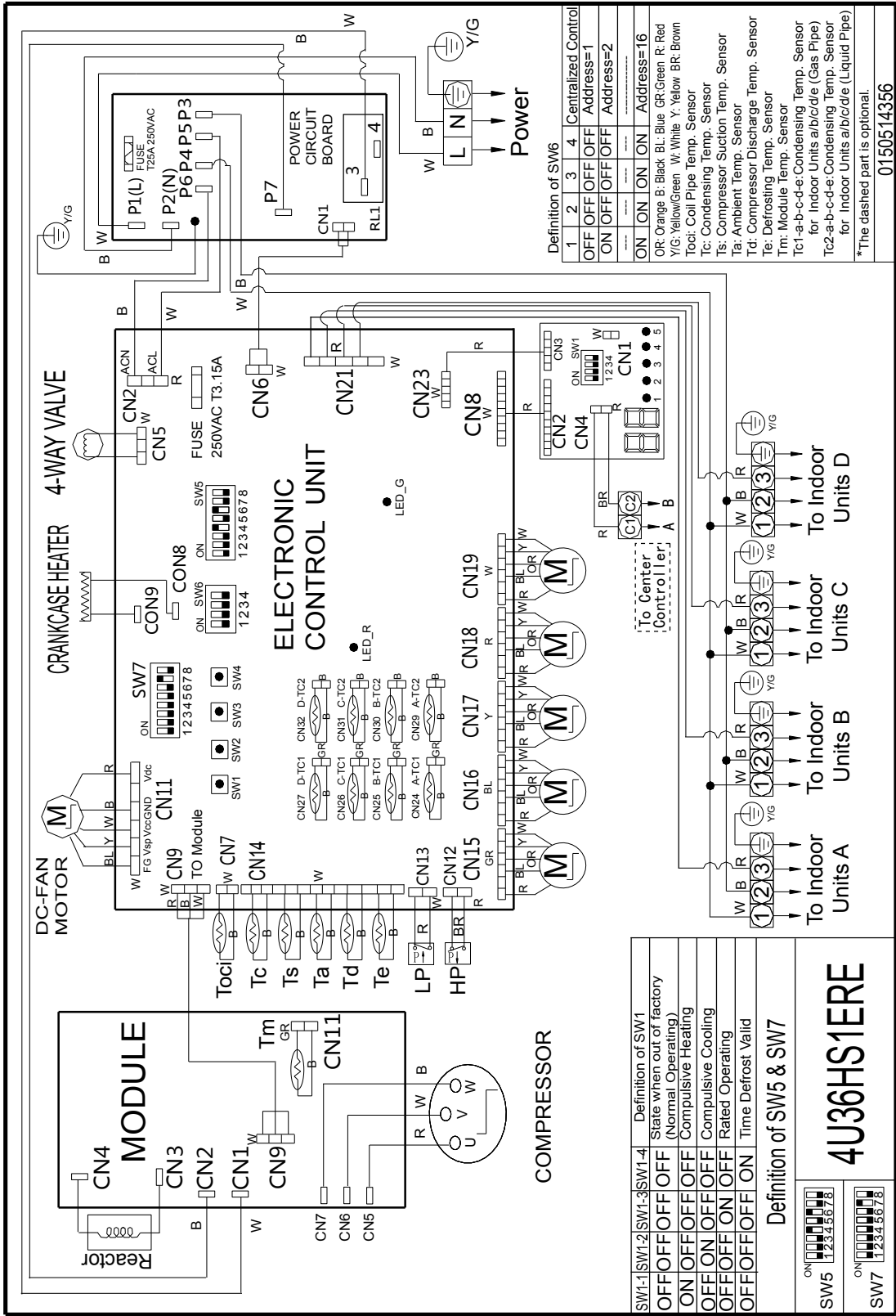


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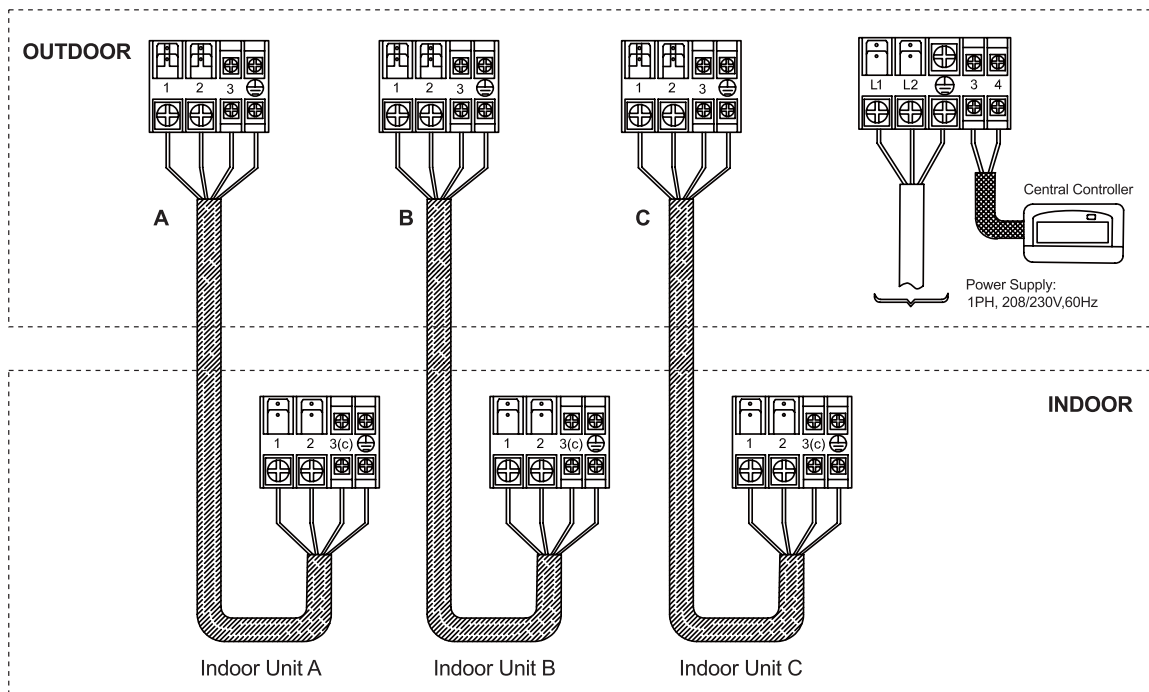


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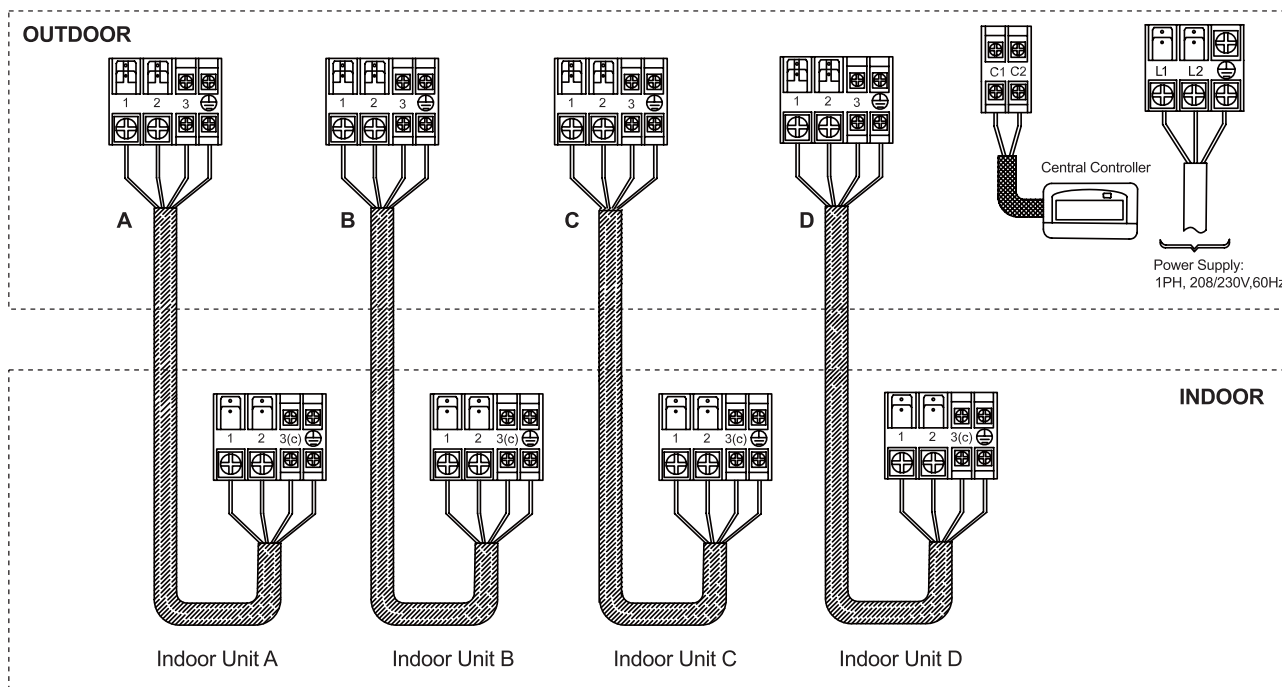


4. Wiring connection

3U24GS1ERE



4U36HS1ERE



Power Supply Cable: 10AWG

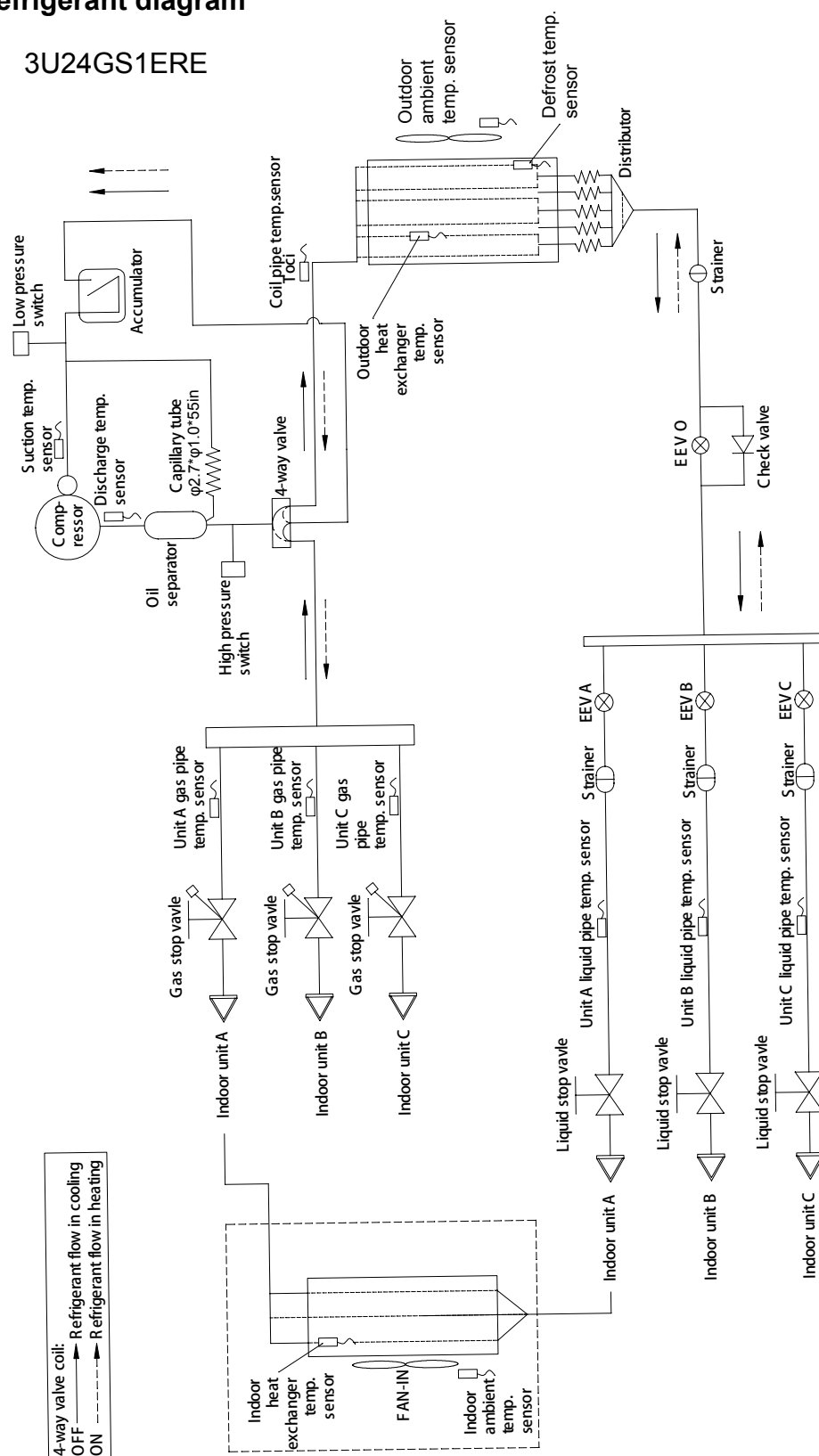
Connecting Cable: 14AWG

Connecting Cable: 14AWG

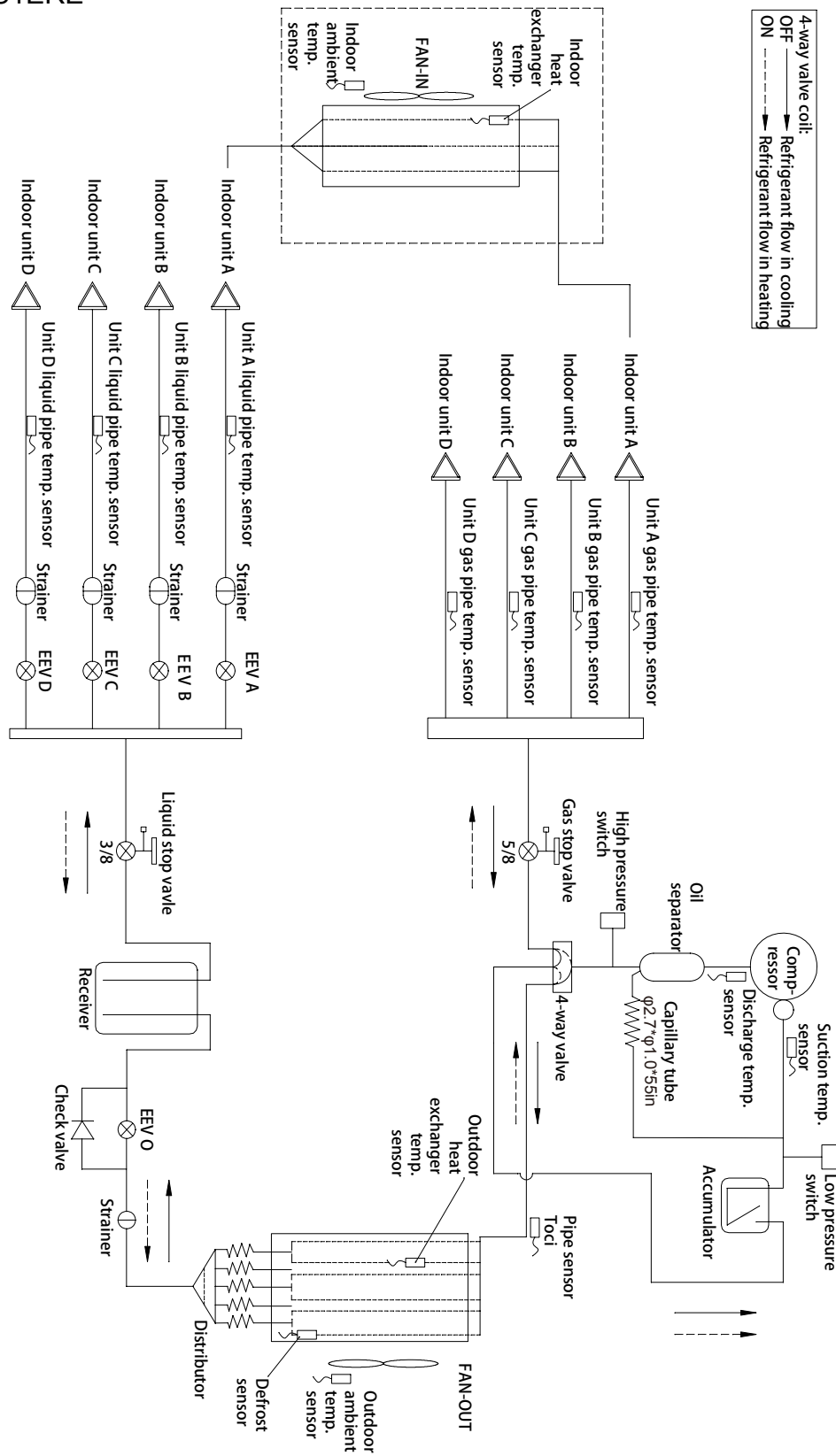
Connect the connecting wires between indoor and outdoor units and ensure the sequence numbers on terminals match with each other.

5. Refrigerant diagram

3U24GS1ERE

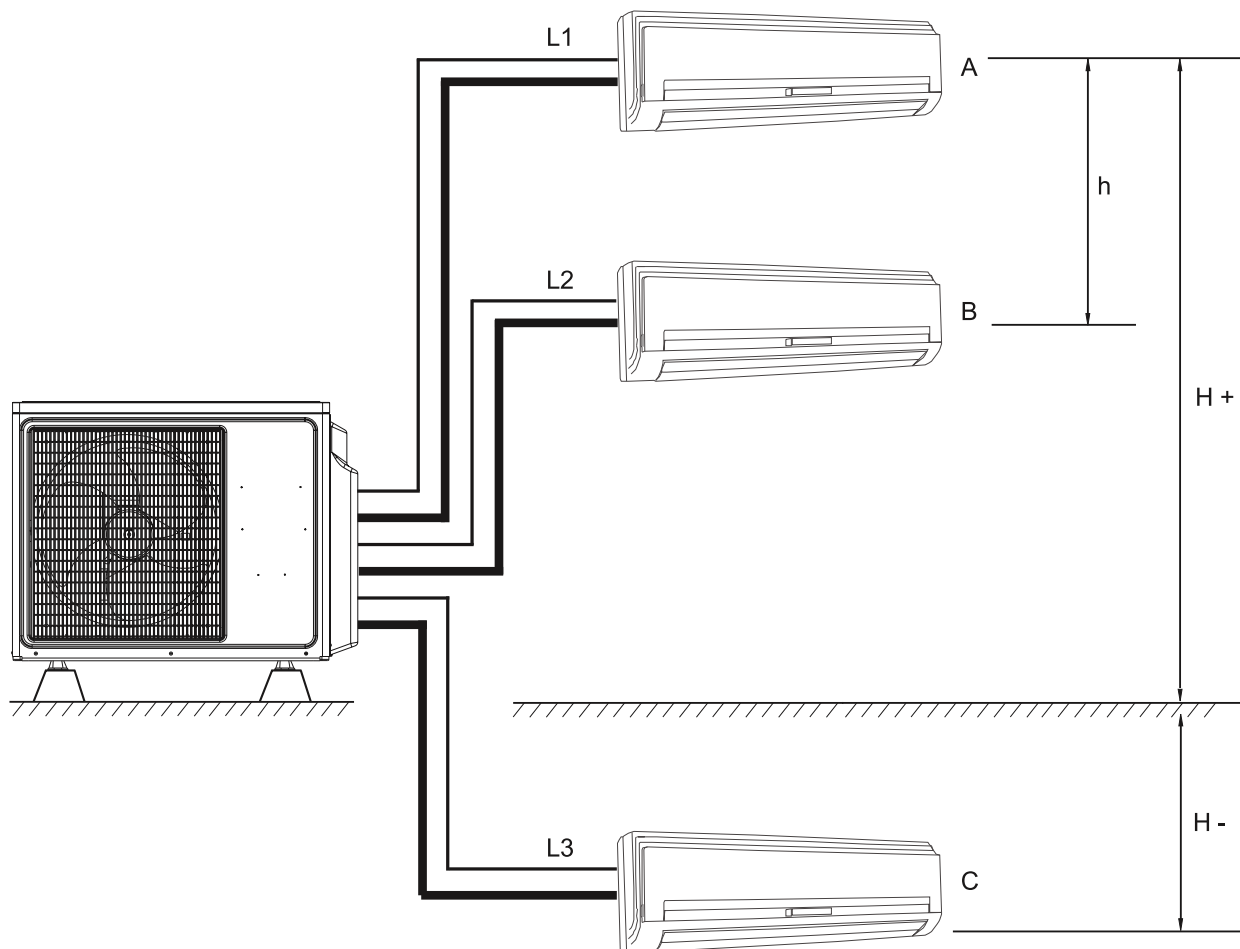


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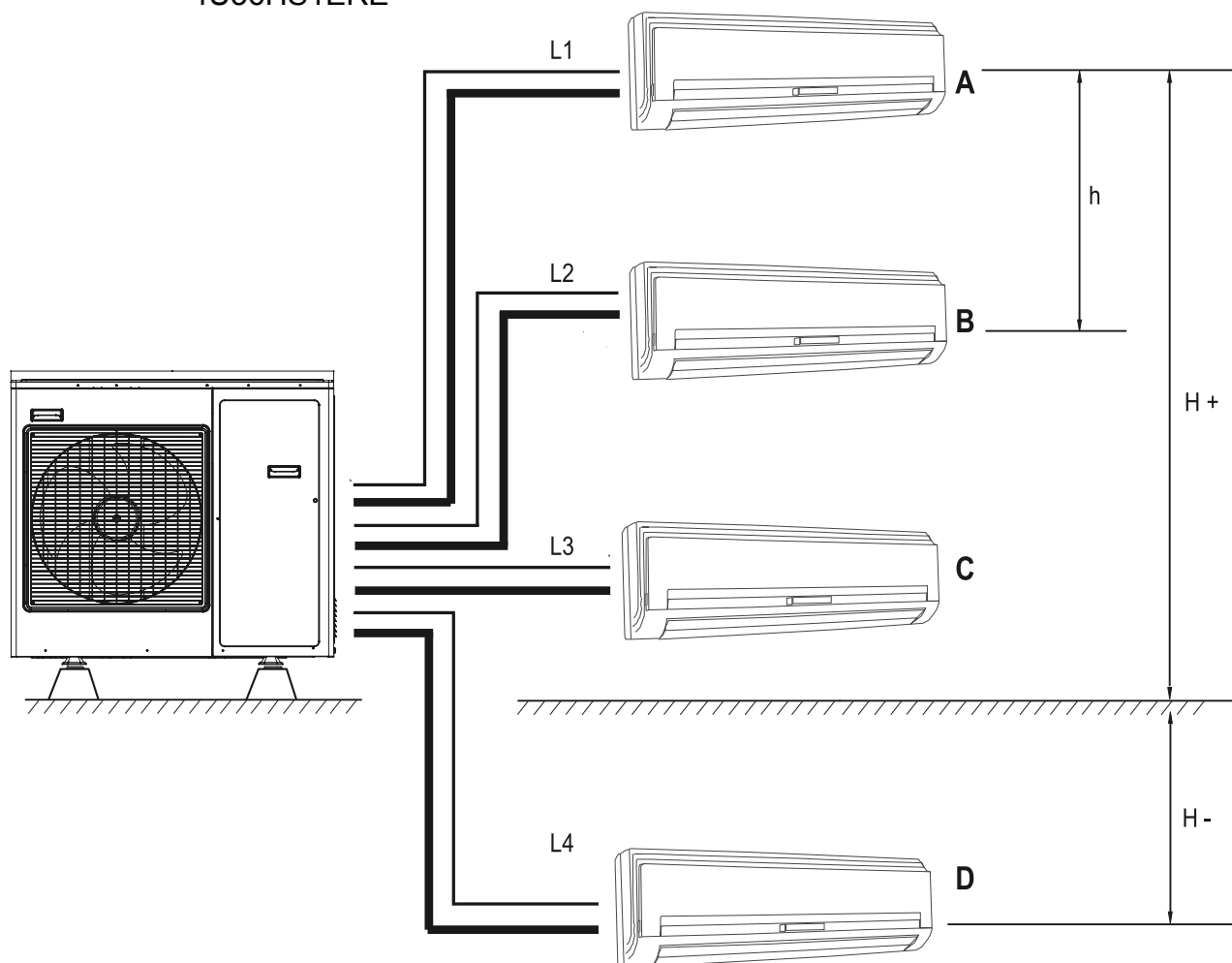
6. Limitation values on pipe installation

3U24GS1ERE



Item	unit	Description	Standard	Maximum
A,B,C liquid pipe	inch	Size of the liquid side connection pipe	Φ0.25	/
A,B,C gas pipe	inch	Size of the gas side connection pipe	Φ0.375	/
L1(one way)	ft	Max.piping length between IU and OU of the way	≤3.1	≤7.6
L2(one way)	ft	Max.piping length between IU and OU of the way	≤3.1	≤7.6
L3(one way)	ft	Max.piping length between IU and OU of the way	≤3.1	≤7.6
L1+L2+L3	ft	Total liquid piping length	≤9.1	≤15.2
h	ft	Drop between every two indoor units when the location of the outdoor unit is among indoor units	≤0.3	≤4.5
	ft	Drop between every two indoor units when the location of the outdoor unit is at one side of indoor units	≤0.3	≤2.2
H+	ft	Drop between the outdoor unit and the indoor unit	≤1.51	≤4.5
H-	ft	Drop between the outdoor unit and the indoor unit when the location of outdoor unit is among the indoor units	≤1.5	≤2.2
	ft	Drop between the outdoor unit and the indoor unit when the location of outdoor unit is at one side of indoor units	≤1.5	≤4.5

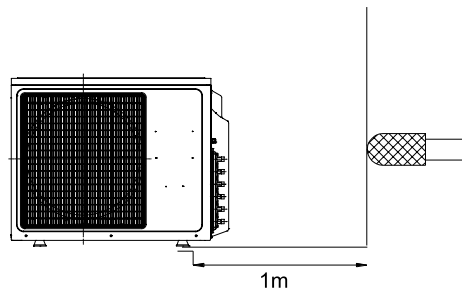
4U36HS1ERE



Item	unit	Description	Standard	Maximum
A,B,C liquid pipe	inch	Size of the liquid side connection pipe	Φ0.25	/
A,B,C gas pipe	inch	Size of the gas side connection pipe	Φ0.375	/
D gas pipe			Φ0.5	
L1(one way)	ft	Max.piping length between IU and OU of the way	≤3.1	≤7.6
L2(one way)	ft	Max.piping length between IU and OU of the way	≤3.1	≤7.6
L3(one way)	ft	Max.piping length between IU and OU of the way	≤3.1	≤7.6
L3(one way)	ft	Max.piping length between IU and OU of the way	≤3.1	≤7.6
L1+L2+L3+L4	ft	Total liquid piping length	≤12.1	≤21.3
h	ft	Drop between every two indoor units when the location of the outdoor unit is among indoor units	≤0.3	≤4.5
	ft	Drop between every two indoor units when the location of the outdoor unit is at one side of indoor units	≤0.3	≤2.2
H+	ft	Drop between the outdoor unit and the indoor unit	≤1.51	≤4.5
H-	ft	Drop between the outdoor unit and the indoor unit when the location of outdoor unit is among the indoor units	≤1.5	≤2.2
	ft	Drop between the outdoor unit and the indoor unit when the location of outdoor unit is at one side of indoor units	≤1.5	≤4.5

7. Sound level

(1) Testing illustration:

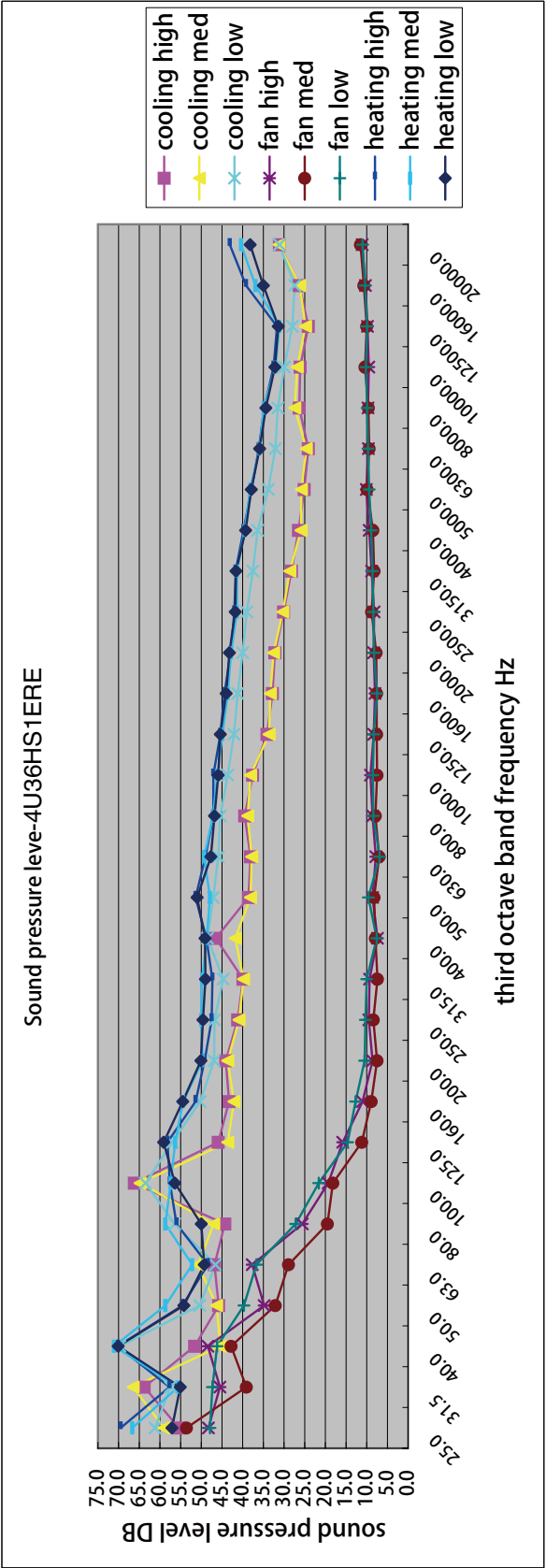
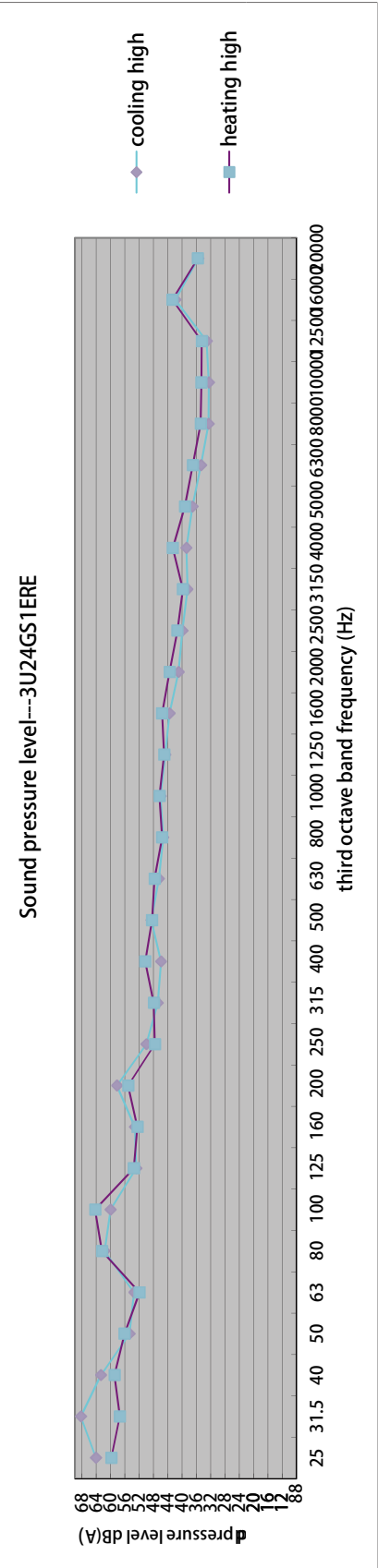


(2) Testing condition:

- a. Unit running in the nominal condition
- b. Test in the semi-anechoic chamber
- c. Noise level varies from the actual factors such as room structure, etc.

(3) Test method

1. Set the unit: 1) the unit is placed on the rubber whose thickness is 5mm; 2) if the height between the air outlet and ground is less than 1m, block the unit up to 1m far from ground
2. Test position: After setting the unit, the test position for the noise is 1m far from the front panel



8. Installation

DISPOSAL REQUIREMENTS:



Your air conditioning product is marked with this symbol. This means that electrical and electronic products shall not be mixed with unsorted household waste. Do not try to dismantle the system yourself: the dismantling of the air conditioning system, treatment of the refrigerant, of oil and of other part must be done by a qualified installer in accordance with relevant local and national legislation. Air conditioners must be treated at a specialized treatment facility for reuse, recycling and recovery. By ensuring this product is disposed of correctly, you will help to prevent potential negative consequences for the environment and human health. Please contact the installer or local authority for more information. Battery must be removed from the remote controller and disposed of separately in accordance with relevant local and national legislation.

IMPORTANT INFORMATION REGARDING THE REFRIGERANT USED

This product contains fluorinated greenhouse gases covered by the Kyoto Protocol. Do not vent into the atmosphere.

Refrigerant type: R410A

GWP*value: 1975

GWP = Global Warming Potential

Please fill in with legible ink

- 1 The factory refrigerant charge of the product
- 2 The additional refrigerant charge of the product
- 1+2 the total refrigerant charge

on the refrigerant charge label supplied with the product. The filled out label must be adhered in the proximity of the product charging port (e.g. onto the inside of the stop valve cover).

A contains fluorinated greenhouse gases covered by the Kyoto Protocol

B factory refrigerant charge of the product: see unit name plate

C additional refrigerant amount charged in the field


D total refrigerant charge

E outdoor unit

F refrigerant cylinder and manifold for charging




Safety Precautions

- Read these Safety Precautions carefully to ensure correct installation.
- This manual classifies the precautions into **WARNING** and **CAUTION**.
- Be sure to follow all the precautions below: they are all important for ensuring safety.



 **WARNING** Failure to follow any of **WARNING** is likely to result in such grave consequences as death or serious injury.



 **CAUTION** Failure to follow any of **CAUTION** may in some cases result in grave consequences.

- The following safety symbols are used throughout this manual:






 Be sure to observe this instruction  Be sure to establish an earth connection  Never attempt

- After completing installation, test the unit to check for installation errors. Give the user adequate instructions concerning the use and cleaning of the unit according to the Operation Manual.

 WARNING	
• Installation should be left to the dealer or another professional. Improper installation may cause water leakage, electrical shock, or fire.	
• Install the air conditioner according to the instructions given in this manual. Incomplete installation may cause water leakage, electrical shock, or fire.	
• Be sure to use the supplied or specified installation parts. Use of other parts may cause the unit to come loose, water leakage, electrical shock, or fire.	
• Install the air conditioner on a solid base that can support the unit's weight. An inadequate base or incomplete installation may cause injury in the event the unit falls off the base.	
• Electrical work should be carried out in accordance with the installation manual and the national electrical wiring rules or code of practice. Insufficient capacity or incomplete electrical work may cause electrical shock or fire.	
• Be sure to use a dedicated power circuit. Never use a power supply shared by another appliance.	
• For wiring, use a cable long enough to cover the entire distance with no connection. Do not use an extension cord. Do not put other loads on the power supply, use a dedicated power circuit. (Failure to do so may cause abnormal heat, electric shock or fire.)	
• Use the specified types of wires for electrical connections between the indoor and outdoor units. Firmly clamp the interconnecting wires so their terminals receive no external stresses. Incomplete connections or clamping may cause terminal overheating or fire.	
• After connecting interconnecting and supply wiring be sure to shape the cables so that they do not put undue force on the electrical covers or panels. Install covers over the wires. Incomplete cover installation may cause terminal overheating, electrical shock, or fire.	
• If any refrigerant has leaked out during the installation work, ventilate the room. (The refrigerant produces a toxic gas if exposed to flames.)	
• After all installation is complete, check to make sure that no refrigerant is leaking out. (The refrigerant produces a toxic gas if exposed to flames.)	
• When installing or relocating the system, be sure to keep the refrigerant circuit free from substances other than the specified refrigerant(R410A), such as air. (Any presence of air or other foreign substance in the refrigerant circuit causes an abnormal pressure rise or rupture, resulting in injury.)	
• During pump-down, stop the compressor before removing the refrigerant piping. If the compressor is still running and the stop valve is open during pump-down, air will be sucked in when the compressor is run, causing abnormal pressure in the freezer cycle which will lead to breakage and even injury.	
• Be sure to establish an earth. Do not earth the unit to a utility pipe, arrester, or telephone earth. In complete earth may cause electrical shock, or fire. A high surge current from lightning or other sources may cause damage to the air conditioner.	
• Be sure to install an earth leakage breaker. Failure to install an earth leakage breaker may result in electric shocks, or fire.	

 CAUTION	
• Do not install the air conditioner in a place where there is danger of exposure to inflammable gas leakage. If the gas leaks and builds up around the unit, it may catch fire.	
• Establish drain piping according to the instructions of this manual. Inadequate piping may cause flooding.	
• Tighten the flare nut according to the specified method such as with a torque wrench. If the flare nut is tightened too hard, the flare nut may crack after a long time and cause refrigerant leakage.	
• Make sure to provide for adequate measures in order to prevent that the outdoor unit be used as a shelter by small animals. Small animals making contact with electrical parts can cause malfunctions, smoke or fire. Please instruct the customer to keep the area around the unit clean.	

Accessories supplied with the outdoor unit:

No.	Drawing	Name of parts	Quantity	Note
1		Drainage elbow	1	3U24GS1ERE
			3	4U36HS1ERE
2		Rubber cushion	4	3U24GS1ERE 4U36HS1ERE
3		Clap	1	3U24GS1ERE
			3	4U36HS1ERE
4		Adaptor(3/8→1/2)	1	3U24GS1ERE 4U36HS1ERE
5		Adaptor(1/2→3/8)	1	4U36HS1ERE

Procedure for Selecting the Location

- 1) Choose a place solid enough to bear the weight and vibration of the unit, where the operation noise will not be amplified.
- 2) Choose a location where the hot air discharged from the unit or the operation noise, will not cause a nuisance to the neighbors of the user.
- 3) Avoid places near a bedroom and the like, so that the operation noise will cause no trouble.
- 4) There must be sufficient space for carrying the unit into and out of the site.
- 5) There must be sufficient space for air passage and no obstructions around the air inlet and the air outlet.
- 6) The site must be free from the possibility of flammable gas leakage in a nearby place.
Locate the unit so that the noise and the discharged hot air will not annoy the neighbors.
- 7) Install units, power cords and inter-unit cables at least 10ft away from television and radio sets. This is to prevent interference to images and sounds. (Noises may be heard even if they are more than 10ft away depending on radio wave conditions.)
- 8) In coastal areas or other places with salty atmosphere of sulfate gas, corrosion may shorten the life of the air conditioner.
- 9) Since drain flows out of the outdoor unit, do not place under the unit anything which must be kept away from moisture.

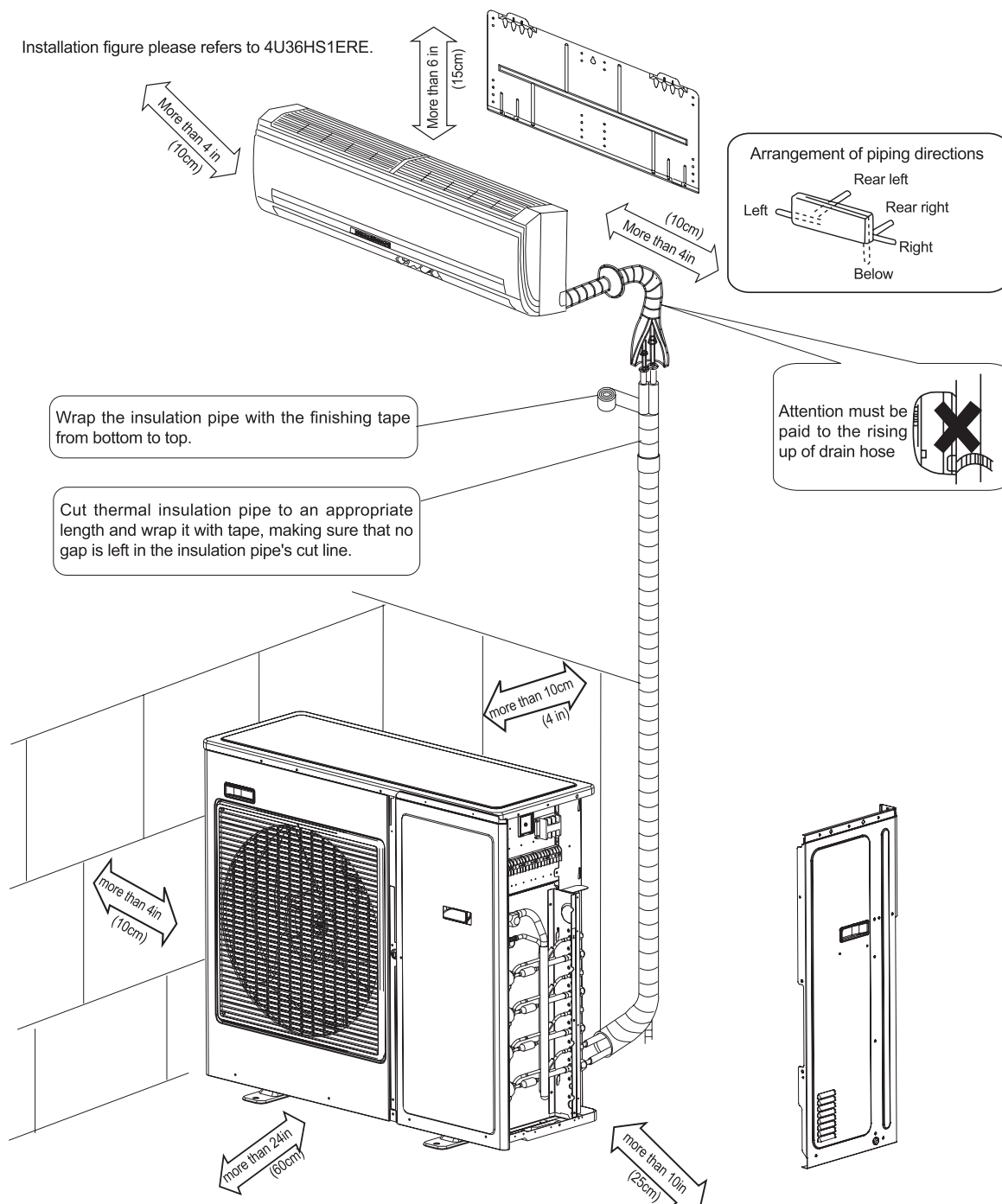
NOTE:

Cannot be installed hanging from ceiling or stacked.

Installation drawings of indoor and outdoor units

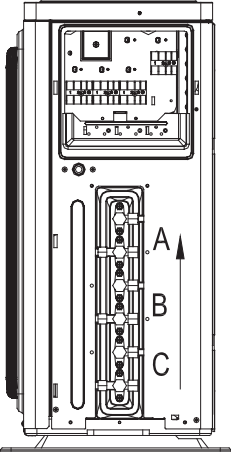
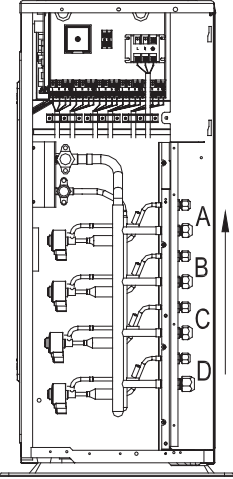
1. Connect indoor and outdoor piping when installing unit. Do not leave piping connected to only one unit
2. You must connect 2 units, minimum

Installation figure please refers to 4U36HS1ERE.



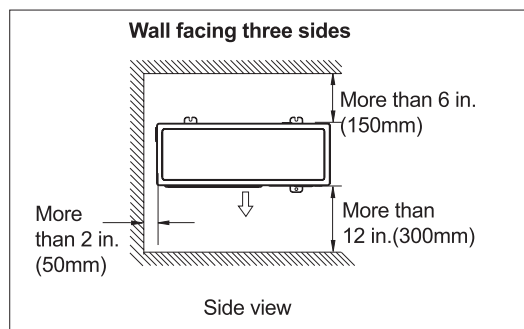
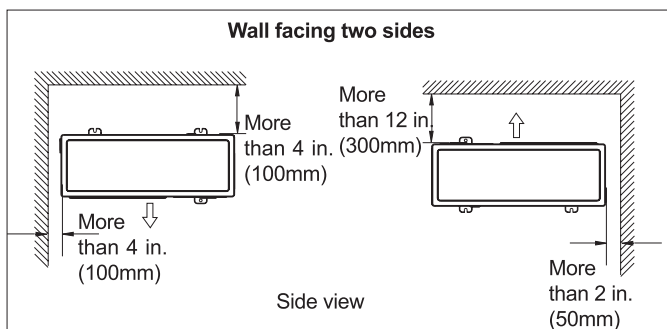
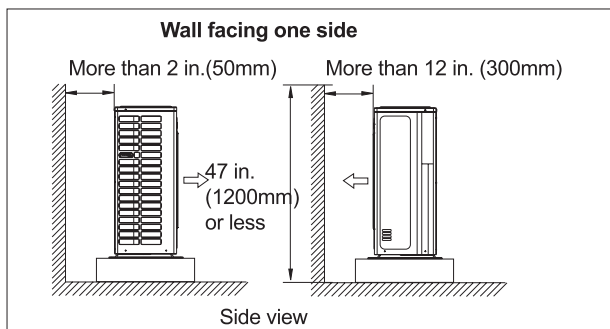
If there is the danger of the unit falling or overturning, fix the unit with foundation bolts, or with wire or other means.
 If the location does not have good drainage, place the unit on a level mounting base(or a plastic pedestal).
 Install the outdoor unit in a level position. Failure to do so may result in water leakage or accumulation.

Installation drawings of indoor and outdoor units

Connection cautions		
model	3U24GS1ERE	4U36HS1ERE
connection priority between indoor and stop valve higher from down to up		
when there is 1 indoor,the prior stop valve is	C	D
when there are 2 indoors,the prior stop valves are	C B	D C
when there are 3 indoors,the prior stop valves are	C B A	D C B
when there are 4 indoors,the prior stop valves are		D C B A
Note: For better oil return and more reliable system, please execute as the above when connecting indoor unit.		

Outdoor Unit Installation Guideline

- Where a wall or other obstacle is in the path of outdoor unit's intake or exhaust airflow, follow the installation guidelines below.
- For any of the below installation patterns, the wall height on the exhaust side should be 47 in. (1200mm) or less.



Limitations on the installation

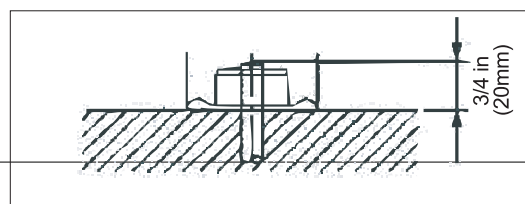
1. Precautions on installation

- Check the strength and level of the installation ground so that unit will not cause any operating vibration or noise after installation.
- In accordance with the foundation drawing in fix the unit securely by means of the foundation bolts.
- It is best to screw in the foundation bolts unit their length are 3/4 in. (20 mm) from the foundation surface.

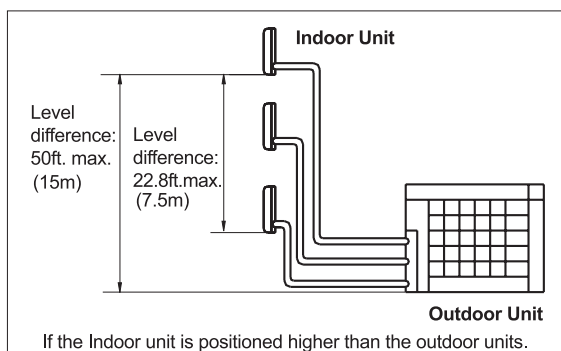
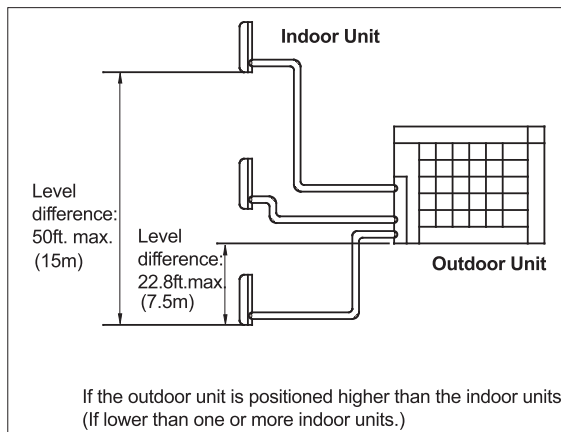
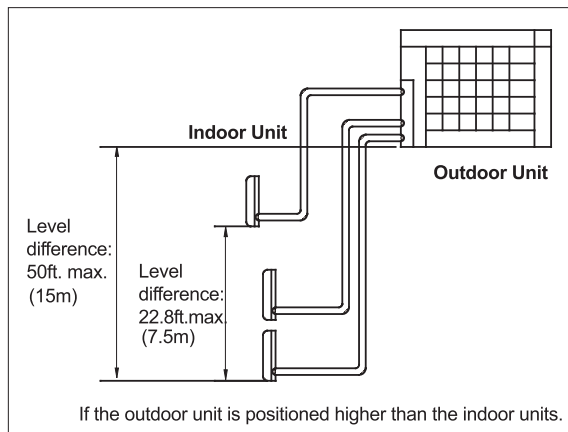
2. Selecting a location for installation of the indoor units

- The maximum allowable length of refrigerant piping, and the maximum allowable height difference between the outdoor and indoor units, are listed below. (The shorter the refrigerant piping, the better the performance. Connect so that the piping is as short as possible. Shortest allowable length per room is 6ft. (2m))

Outdoor unit capacity class	3U24GS1ERE	4U36HS1ERE
Piping to each indoor unit	82ft. max. (25m)	82ft. max. (25m)
Total length of piping between all units	197ft. max. (60m)	227ft. max. (70m)



Limitations on the installation



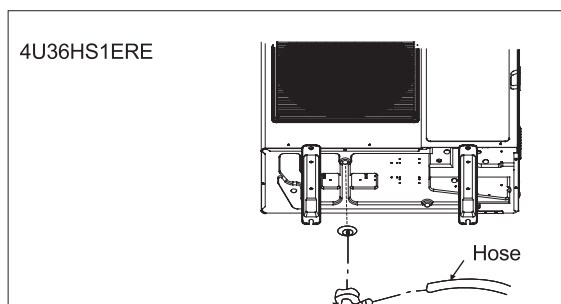
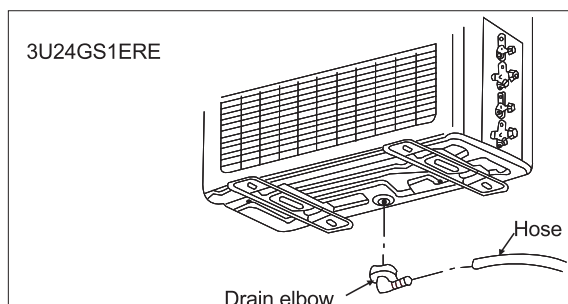
Refrigerant piping work

1. Installing outdoor unit

- 1) When installing the outdoor unit, refer to "Precautions for Selecting the Location" and the "Indoor/Outdoor Unit Installation Drawings".
- 2) If drain work is necessary, follow the procedures below.

2. Drain work

- 1) Use drain plug for drainage.
- 2) If the drain port is covered by a mounting base or floor surface, place additional foot bases of at least 1 1/6in(30mm) in height under the outdoor unit's feet.
- 3) In cold areas, do not use a drain hose with the outdoor unit. (Otherwise, drain water may freeze, impairing heating performance.)

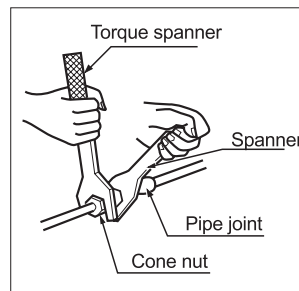
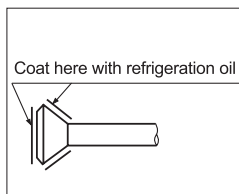


Refrigerant piping work

3. Refrigerant piping work

- Align the centres of both flares and tighten the flare nuts 3 or 4 turns by hand. Then tighten them fully with the tor wrenches.
Use torque wrenches when tightening the flare nuts to prevent damage to the flare nuts and escaping gas.

Flare nut tightening torque	
Flare nut for $\varnothing 1/4"$ (6.35mm)	126-152lb.in(14.2-17.2N.m)
Flare nut for $\varnothing 3/8"$ (9.52mm)	289-353lb.in(32.7-39.9N.m)
Flare nut for $\varnothing 1/2"$ (12.7mm)	438-534lb.in(49.5-60.3N.m)
Flare nut for $\varnothing 5/8"$ (15.88mm)	547-667lb.in(61.8-75.4N.m)



Valve cap tightening torque	
Liquid pipe	235-286lb.in(26.5-32.3N.m)
Gas pipe	426-528lb.in(48.1-59.7N.m)

Service port cap tightening torque	
	96-130lb.in(10.8-14.7N.m)

- To prevent gas leakage, apply refrigeration oil on both inner and outer surfaces of the flare. (Use refrigeration oil for R410A)

4. Purging air and checking gas leakage

When piping work is completed, it is necessary to purge the air and check for gas leakage.

WARNING

- Do not mix any substance other than the specified refrigerant (R410A) into the refrigeration cycle.
- When refrigerant gas leaks occur, ventilate the room as soon and as much as possible.
- R410A, as well as other refrigerants, should always be recovered and never be released directly into the environment.
- Use a vacuum pump for R410A exclusively. Using the same vacuum pump for different refrigerants may damage the vacuum pump or the unit. Pull vacuum down to 300 microns.

- Use a hexagonal wrench (3/19") to operate the stop valve rod.
- All refrigerant pipe joints should be tightened with a torque wrench at the specified tightening torque.

Connect projection side of charging hose(Which comes from gauge manifold) to gas stop valve's service port.



Fully open gauge manifold's low-pressure valve(Lo) and completely close its high-pressure valve(Hi).
(High-pressure valve subsequently requires no operation.)



Apply vacuum pumping. Check that the compound pressure gauge reads-30 PSI.
Evacuation for at least 30 minutes.



Close gauge manifold's low-pressure valve(Lo) and stop vacuum pump.
(Leave as is for 4-5 minutes and make sure gauge doesn't move. If it does go up, this indicates the presence of moisture or leaking from connecting parts. After inspecting all the connection and loosening then retightening the nuts, repeat steps 2-4.)



Remove covers from liquid stop valve and gas stop valve.



Turn the liquid stop valve's rod 90 degrees counterclockwise with a hexagonal wrench to open valve.
Close it after 5 seconds, and check for gas leakage.
Using soapy water, check for gas leakage from indoor unit's flare and outdoor unit's flare and valve rods.
After the check is complete, wipe all soapy water off.



Disconnect charging hose from gas stop valve's service port, then fully open liquid and gas stop valves.
(Do not attempt to turn valve rod beyond its stop.)



Tighten valve caps and service port caps for the liquid and gas stop valves with a torque wrench at the specified torques. See "3 Refrigerant piping" on page 6 for details.

Refrigerant piping work

5. Refilling the refrigerant

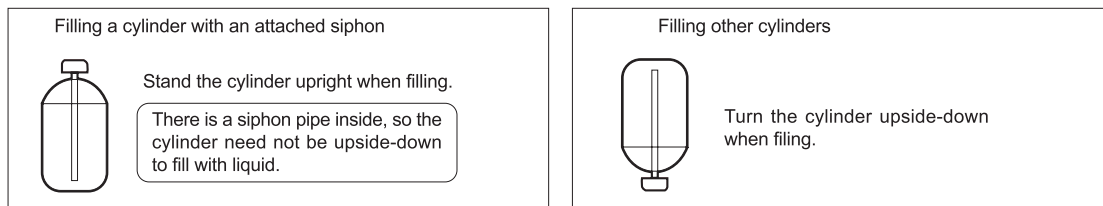
Check the type of refrigerant to be used on the machine nameplate.

Precautions when adding R410A

Fill from the liquid pipe in liquid form.

It is a mixed refrigerant, so adding it in gas form may cause the refrigerant composition to change, preventing normal operation.

1) Before filling, check whether the cylinder has a siphon attached or not. (It should have something like "liquid filling siphon attached" displayed on it.)



2) Be sure to use the R410A tools to ensure pressure and to prevent foreign objects entering.

6. Charging with refrigerant

1) This system must use refrigerant R410A.

2) Add refrigerant 0.21 oz. per foot when the total piping length exceeds the standard value, but make sure that the total liquid piping length should be less than the max. value.

Outdoor Unit	Standard total liquid piping length	Max. total liquid piping length
3U24GS1ERE	98ft. (30m)	197ft. (60m)
4U36HS1ERE	131ft. (40m)	227ft. (70m)

Notes:

- When using this product, you need not to set the address. But the L/N wires between indoor & outdoor units must be corresponded, or there will be communication failure.
- Quiet Operation Setting. Set the DIP "8" to ON position of SW5, the system will run with lower noise, but the max. capacity will also reduce slightly.
- Do not change the settings of other switches, wrong settings can make the system damage or other malfunctions.

7. Precautions for Running Refrigerant Piping

• Cautions on pipe handling

- Protect the open end of the pipe against dust and moisture.
- All pipe bends should be as gentle as possible. Use a pipe bender for bending. (Bending radius should be 1 1/4" to 1 3/4" (30 to 40mm) or larger.)

• Selection of copper and heat insulation materials

When using commercial copper pipes and fittings, observe the following:

1) Insulation material: Polyethylene foam

Heat transfer rate: 0.035 to 0.045 kcal/mh°C (0.041 to 0.052 W/mK)

Refrigerant gas pipe's surface temperature reaches 230°F max.

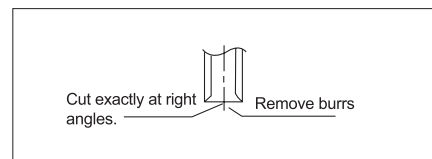
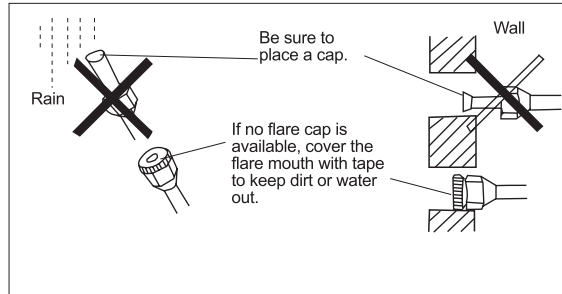
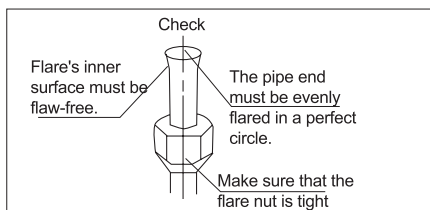
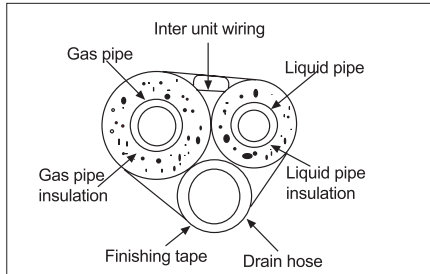
Choose heat insulation materials that will withstand this temperature.

2) Be sure to insulate both the gas and liquid piping and to provide insulation dimensions as below.

Gas pipe	Gas pipe insulation
O.D.: 3/8" (9.52mm), 1/2" (12.7mm) Thickness: 3/95" (0.8mm)	I.D.: 1/2"-3/5" (12-15mm), 1/2" (12.7mm) Thickness: 1/2" (13mm) min.
Liquid pipe	Liquid pipe insulation
O.D.: 1/4" (6.35mm) Thickness: 3/95" (0.8mm)	I.D.: 6/19"-2/5" (8-10mm) Thickness: 2/5" (10mm) min.

Refrigerant Piping Work

3) Use separate thermal insulation pipes for gas and liquid refrigerant pipe.



Set exactly at the position shown below.			
<p>Flare tooling die</p>	Flare tool for R410A	Conventional flare tool	
	Clutch-type	Clutch-type(Rigid-type)	Wing-nuttype(Imperial-type)
	0-1/51" (0-0.5mm)	3/16"-1/16"(1.0-1.5mm)	1/16"-1/8"(1.5-2.0mm)

8. Cutting and Flaring work of piping

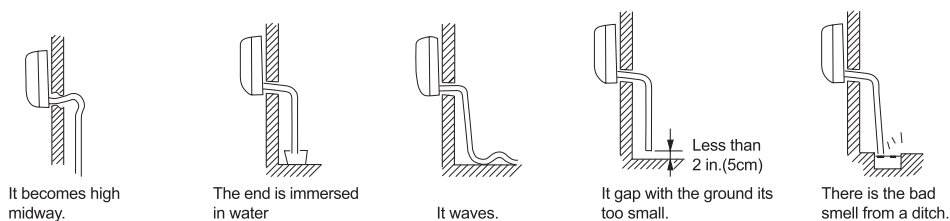
- Pipe cutting is carried out with a pipe cutter and burs must be removed.
- After inserting the flare nut, flaring work is carried out.

	Pipe	Pipe diameter ϕ (mm)	Size A
<p>Flare tooling die</p>	Liquid side	1/4"(6.35mm)	3/16"~11/16"(0.8~1.5mm)
	Gas side	3/8"(9.52mm)	3/16"~11/16"(1.0~1.5mm)
		1/2"(12.7mm)	3/16"~11/16"(1.0~1.5mm)

Correct	Incorrect				
	Lean	Damage of flare	Crack	Partial	Too outside

9. On drainage

- Please install the drain hose so as to be downward slope without fail. Please don't do the drainage as shown below.



- Please pour water in the drain pan of the indoor unit, and confirm that drainage is carried out serenely to outdoor.
- In case that the attached drain hose is in a room, please apply heat insulation to it without fail.

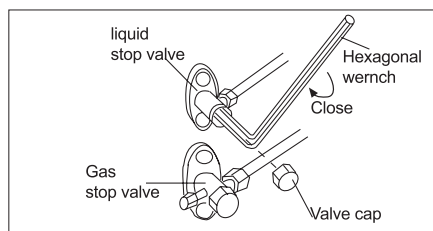
⚠ WARNING

- 1) Do not use mineral oil on flared part.
- 2) Prevent mineral oil from getting into the system as this would educe the lifetime of the units.
- 3) Never use piping which has been used for previous installations. Only use parts which are delivered with the unit.
- 4) Do not install a filter dryer.
- 5) The drying material may dissolve and damage the system.
- 6) A bad flare may cause refrigerant gas to leak.

Pump Down Operation

In order to protect the environment, be sure to pump down when relocating or disposing of the unit.

- 1) Remove the valve caps from liquid stop valve and gas stop valve.
- 2) Carry out forced cooling operation.
- 3) After five to ten minutes, close the liquid stop valve with a hexagonal wrench.
- 4) After two to three minutes, close the gas stop valve and stop forced cooling operation.



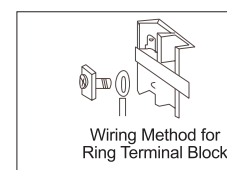
Wiring work

1. Electric wiring

- The air conditioner must use special circuit , and wiring by the qualified electrician according to the wiring rules specified in national standard.
- The grounding wire and the neutral wire shall be strictly separated. Connect the neutral wire with grounding wire is incorrect.
- The electric leakage breaker must be installed.
- All the electric wire must be copper wire. Power supply: 1PH, 208-230V~, 60Hz.
- The wiring method of power line is Y connection. If the power line is damaged, in order to avoid risk of electric shock, it must be replaced by the manufacturer or its repair center or other similar qualified person. The connecting cable must be shielded.
- Fuse: T3.15A 250VAC T16A 250VAC (Please check with the outdoor unit wiring diagram.)
- Please check the circuit diagram about the fuse replaced.

2. Wiring method

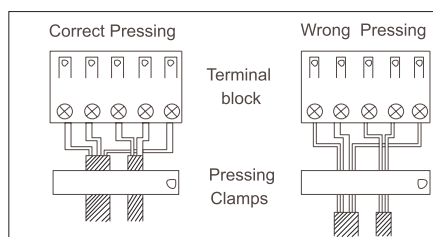
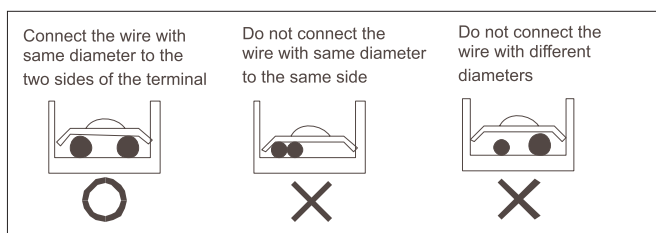
- Wiring method of orbicular terminals
For the connection wire with orbicular terminals, its wiring method is as shown in the right figure: remove the connecting screw, put the screw through the ring on the end of the wire, then connect to the terminal block and fasten screw.



Wiring method of straight terminals .

- For the connection wire without orbicular terminals, its wiring method is: loosen the connection screw, and insert the end of the connection wire completely into the Terminal block, then fasten the screw.
Slightly pull the wire outwards to confirm it is firmly held.

- Crimp connection method for wires without terminals



- Crimp connection method for connection wire
After connection, the wire must be fastened by wire cover. The wire cover shall press on the protection coat of the connection wire, as shown in right top figure.
Note: When connecting the wiring, confirm the terminal number of indoor and outdoor units carefully. Incorrect wiring will damage the controller of air conditioner or the unit can not operate.

3. Wiring method of outdoor unit:

• Power line

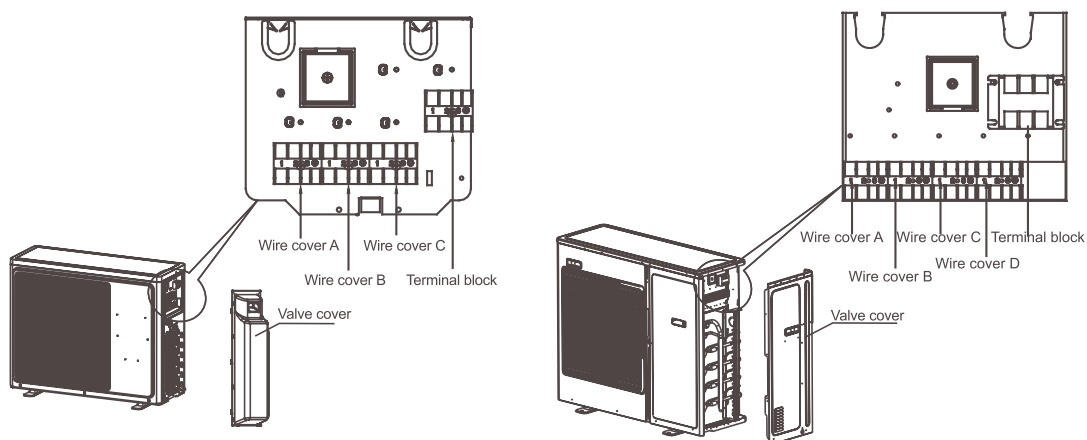
Remove the repair board of the outdoor unit and loosen the wire cover A, then put the live wire, neutral wire and grounding wire through the wire cover, and connect them to terminal block correspondingly. After connection, fasten wire cover to its previous state.

• Communication wire of indoor unit.

Loosen wire cover , put the communication wire through the wire cover B, and connect them to terminal block correspondingly. After connection, fasten wire cover B to its previous state.

Note: Power line and communication wire are provided by consumers themselves.

Wiring work



4. Wiring method of indoor unit

Loosen wire cover and connect the power line and communication wire of indoor unit to the terminal correspondingly.

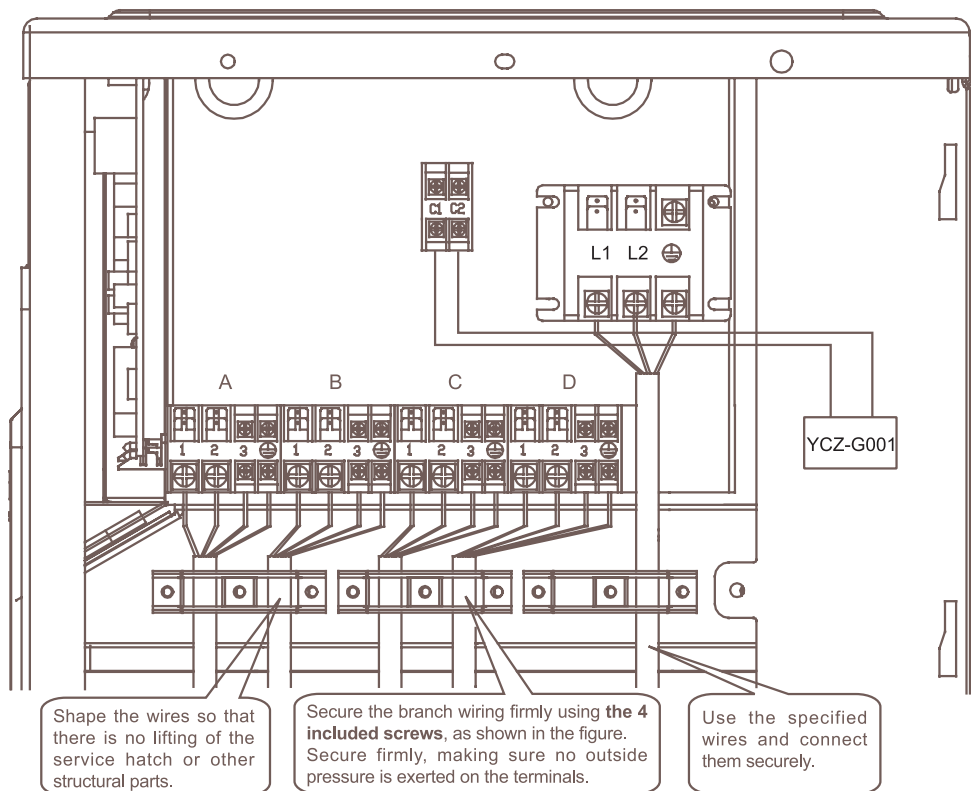
Note:

When connecting power line to power supply terminal, please pay attention to the following items:

- Do not connect the power line with different dimensions to the same connection wire end.
Improper contact will cause heat generation.
- Do not connect the power line with different dimensions to the same grounding wire end.
Improper contact will affect protection.
- Do not connect the power line to the connecting end of communication wire.
Incorrect connection will cause damage to the connected unit.

5. Example wiring diagram.

Wiring diagram please refers to 4U36HS1ERE



Test running

- Before starting the test running, please confirm the following works have been done successfully.

- 1) Correct piping work;
- 2) Correct wiring work;
- 3) Correct match of indoor and outdoor unit;
- 4) Proper recharge of refrigerant if needed.

- Make sure that all the stop valves are fully open.
- Check the voltage supplied to the outdoor and indoor units, please confirm that is 208/230V.

Wiring Error Check

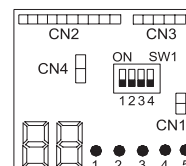
This product is capable of automatic checking of wiring error.

Switch on all the 4 dip-switches on the outdoor unit small service PC-board as shown on the right. Then power off the unit and power on again, the system will enter the operation of "Wiring Error Check". After 3 minutes stand-by, the unit starts for automatic wiring checking.

Approximately 30 ~ 50minutes (depends on how many units installed in the system) after the unit starts, the Errors of the wiring will be shown by the LEDs (1 to 5).

During this operation, the digital-number will alternately show the compressor working frequency (e.g. 50 stands for the current running frequency) and letter "CH"(means checking).

After this operation, if all the wiring is correct, the digital-number will show "0", if there has wrong wiring, the digital-number will show "EC"(error connection) and also it will flashing.



The service monitor LEDs indicate the error of wiring, as shown in the table below. For details about how to read the LED display, refer to the service manual.

If self-checking is not possible, check the indoor unit wiring and piping in the usual manner.

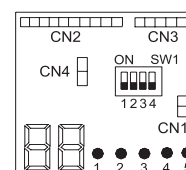
LED	1	2	3	4	5	Message
Status	OFF					Unit not connected
	ALL Flashing					Automatic checking impossible, all units connect wrong
	ALL ON					All units connect correctly
	ON	FLASHING	FLASHING	ON	FLASHING	ON: unit connect correctly FLASHING: unit connect wrong, need to change the wiring manually between 2,3, and 5
	ON	FLASHING	FLASHING	ON	ON	ON: unit connect correctly FLASHING: unit connect wrong, need to change the wiring manually between 2,3
	Only one LED flashing					Abnormal

Test running.

- 1) If the temperature is lower than 60 °F, it is impossible to test cooling with remote controller, and also when the temperature is higher than 80 °F, it is impossible to test heating.
- 2) To test cooling, set the lowest temperature at 60 °F. To test heating, set the highest temperature, at 86 °F.
- 3) Please check both cooling and heating operation of each unit individually and then also check the simultaneous operation of all indoor units.
- 4) After running the unit for about 20 minutes, check the indoor unit outlet temperature.
- 5) After the unit is stopped, or working mode changed, the system will not start again for about 3 minutes.
- 6) During cooling operation, frost may occur on the indoor unit or pipes, this is normal.
- 7) Operate the unit according to the operation manual. Please kindly explain to our customers how to operate through the instruction manual.

Seven-segment numeric display

- 1) When unit is running, this seven-segment numeric will display the frequency of compressor. For example, "40" means compressor running frequency is 40 Hz, "108" means compressor running frequency is 108Hz.
- 2) When a fault happens, seven-segment numeric will flash and display some numbers, this number is failure code. For example, a flashing "32" means No.32 failure, that is indoor and outdoor communication error.



Communication LED

5 green LED means 5 indoor units. If one LED keep lighting that means the corresponding indoor unit has good communication with outdoor unit. If one LED is not lighting, that means there is no communication between indoor and outdoor.

9. Dip switch setting, outdoor unit PCB photo, and function

9.1 Dip switch setting and Outdoor unit PCB photo

Model	PCB	Power module	Filter board
3U24GS1ERE	0151800075 0151800076	0150400643	0150400699
4U36HS1ERE	0151800075 0151800076	0150400908	0150400699

Dip switch setting

Outdoor main PCB 0151800075 dip switch setting

SW5 definition

1	2	3	4	5	6	7	8	Decription
ON	---	---	---	---	---	---	---	Cooling only
OFF	---	---	---	---	---	---	---	Heating pump(default)
---	ON	---	---	---	---	---	---	set ON if frost easily
---	OFF	---	---	---	---	---	---	set OFF if hard to frost(default)
---	---	ON	---	---	---	---	---	Max.running current is 15A
---	---	OFF	---	---	---	---	---	Normal control(default)
---	---	---	OFF	ON	OFF	---	---	3U24
---	---	---	ON	OFF	ON	---	---	4U36
---	---	---	---	---	---	ON	---	temperature correction valid
---	---	---	---	---	---	OFF	---	temperature correction null(default)
---	---	---	---	---	---	---	ON	Quiet operation valid
---	---	---	---	---	---	---	OFF	Quiet o poperationeration vaild(default)

SW6 : outdoor central control address setting

1	2	3	4	outdoor central control address
OFF	OFF	OFF	OFF	1
OFF	OFF	OFF	ON	2
OFF	OFF	ON	OFF	3
.....			
ON	ON	ON	ON	16

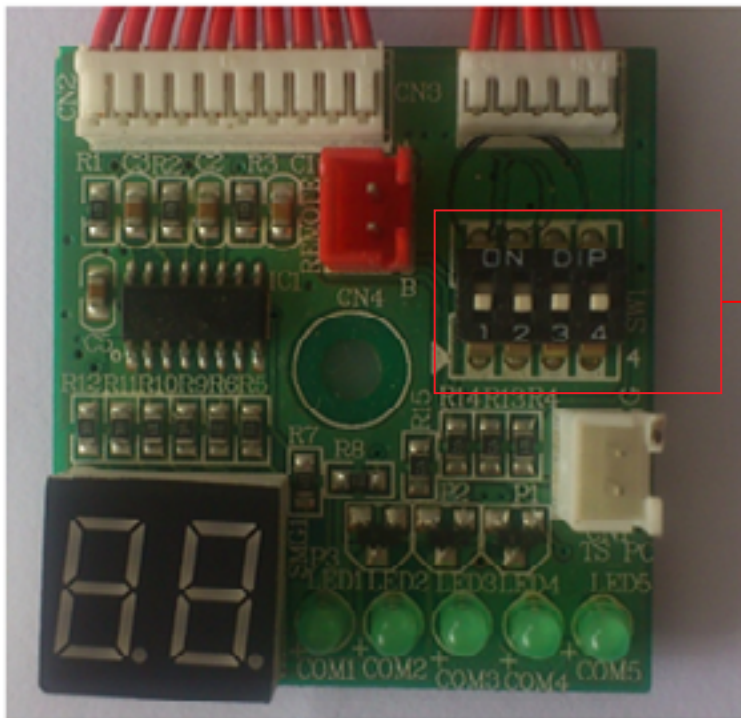
SW7: pre-set dip switch

Small service PCB:0151800076 dip switch setting

SW1 definition:

1	2	3	4	Definition
OFF	OFF	OFF	OFF	State when out of factory
ON	OFF	OFF	OFF	Compulsive heating: 50Hz, outdoor motor 5-class, standard open angle 200, the others are normal
OFF	ON	OFF	OFF	Compulsive cooling: 60Hz, outdoor motor 7-class, standard open angle 200, the others are normal
OFF	OFF	ON	OFF	Rated operation
OFF	OFF	OFF	ON	Time defrost valid
ON	ON	ON	ON	Detection for wrong wiring

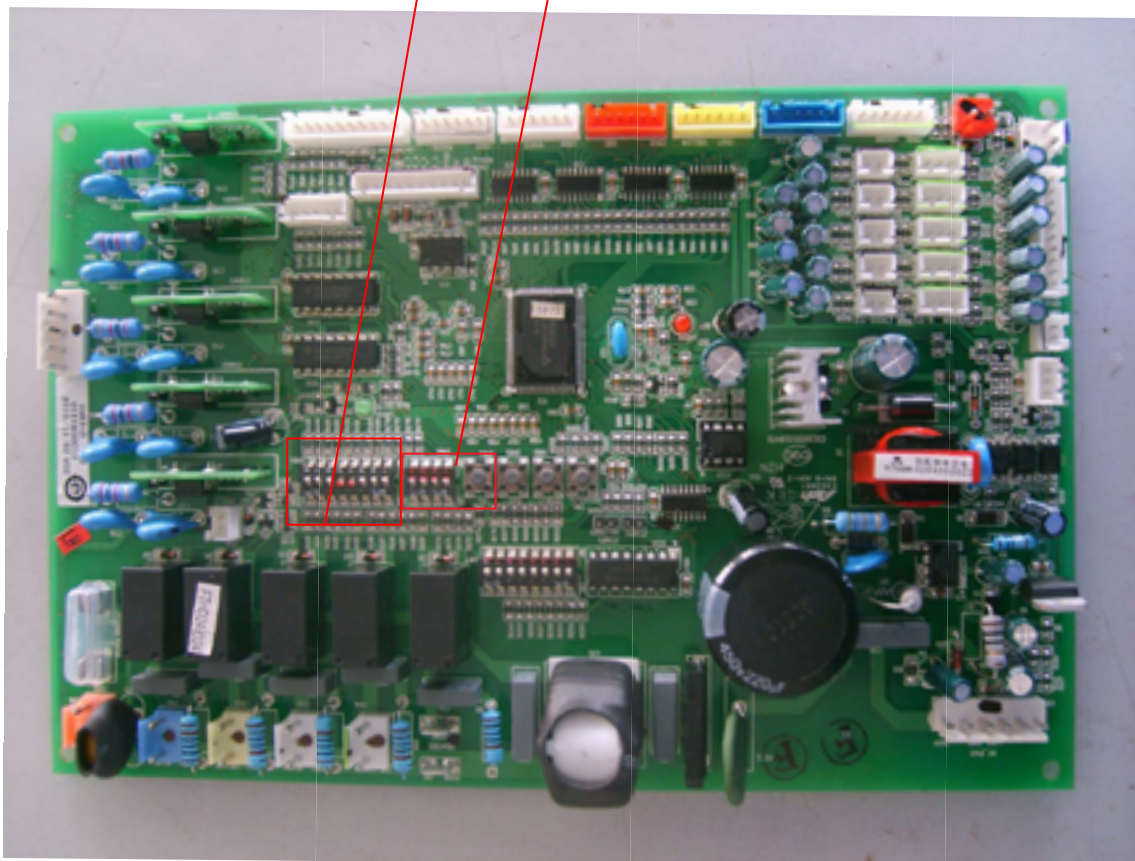
PCB(0151800076)



SW06

PCB (0151800075)

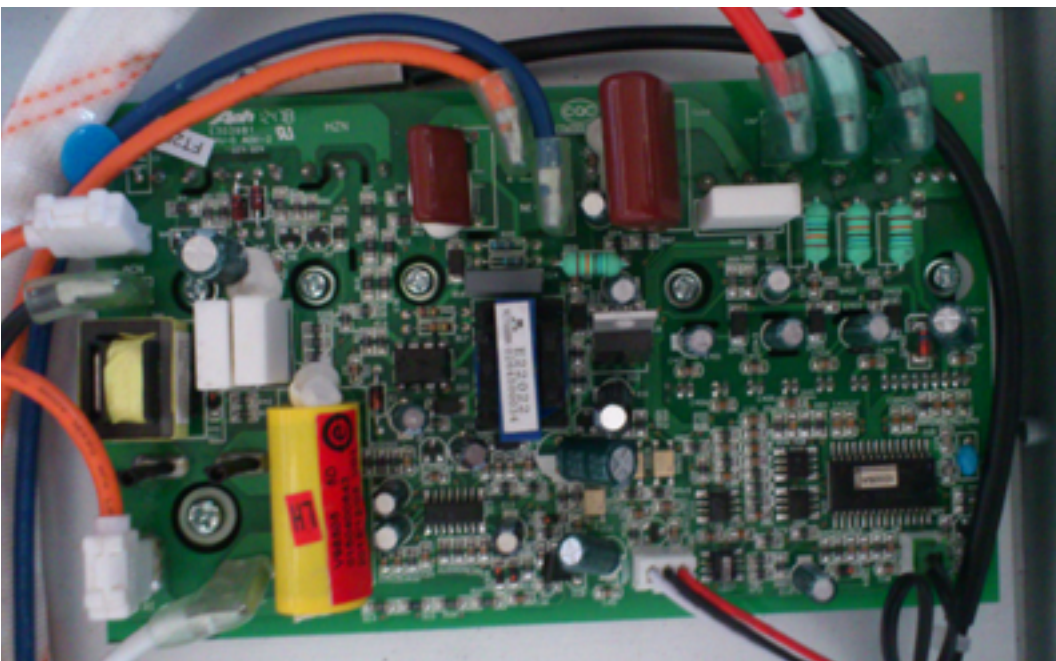
SW05 SW06



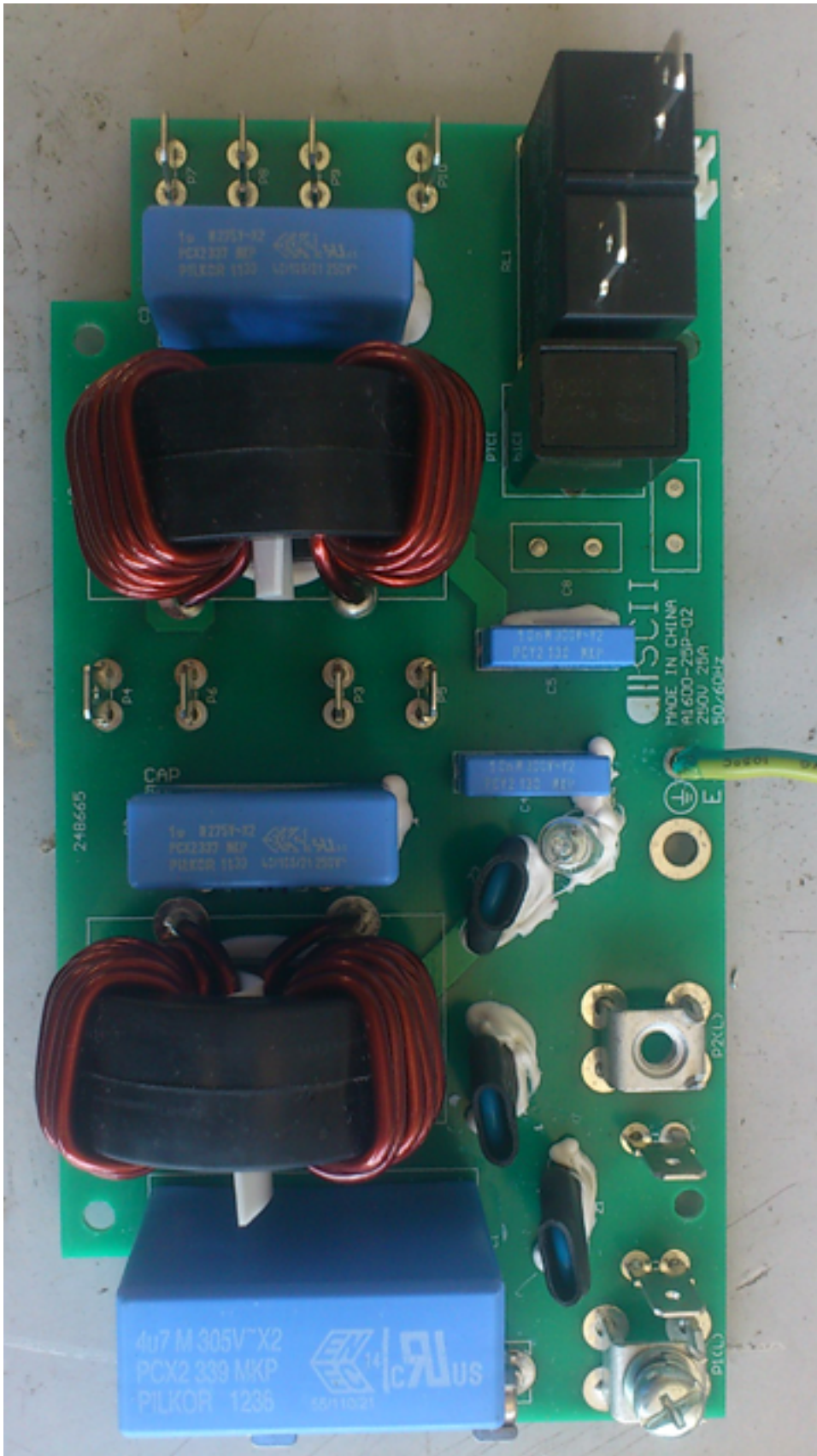
Power module(0150400908)



Power module(0150400643)



Filter board(0150400699)



Dip switch setting

Outdoor main PCB 0151800075 dip switch setting

SW5 definition

1	2	3	4	5	6	7	8	Decription
ON	---	---	---	---	---	---	---	Cooling only
OFF	---	---	---	---	---	---	---	Heating pump(default)
---	ON	---	---	---	---	---	---	set ON if frost easily
---	OFF	---	---	---	---	---	---	set OFF if hard to frost(default)
---	---	ON	---	---	---	---	---	Max.running current is 15A
---	---	OFF	---	---	---	---	---	Normal control(default)
---	---	---	OFF	ON	OFF	---	---	3U24
---	---	---	ON	OFF	ON	---	---	4U36
---	---	---	---	---	---	ON	---	temperature correction valid
---	---	---	---	---	---	OFF	---	temperature correction null(default)
---	---	---	---	---	---	---	ON	Quiet operation valid
---	---	---	---	---	---	---	OFF	Quiet o poperationeration vaild(default)

SW6 : outdoor central control address setting

1	2	3	4	outdoor central control address
OFF	OFF	OFF	OFF	1
OFF	OFF	OFF	ON	2
OFF	OFF	ON	OFF	3
.....			
ON	ON	ON	ON	16

SW7: pre-set dip switch

Small service PCB:0151800076 dip switch setting

SW1 definition:

1	2	3	4	Definition
OFF	OFF	OFF	OFF	State when out of factory
ON	OFF	OFF	OFF	Compulsive heating: 50Hz, outdoor motor 5-class, standard open angle 200, the others are normal
OFF	ON	OFF	OFF	Compulsive cooling: 60Hz, outdoor motor 7-class, standard open angle 200, the others are normal
OFF	OFF	ON	OFF	Rated operation
OFF	OFF	OFF	ON	Time defrost valid
ON	ON	ON	ON	Detection for wrong wiring

9.2 Outdoor unit control

9.2.1 Outdoor frequency control

A. Compressor running frequency range: 20~95RPS

10.2.2 Electronic expansion valve (EEV) control

A: EEV specification

Max. open angle	500 pulse
Driving speed	PPS

B: Start-up control

In Cool/Dry mode, standard open angle: outdoor ambient temp. $\geq 68^{\circ}\text{F}$, 250 pulse(E); Outdoor ambient temp. $< 68^{\circ}\text{F}$, 210 pulse(E);

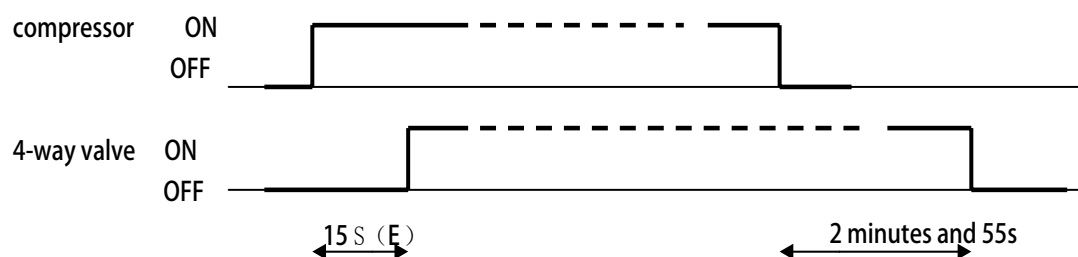
In Heat mode, standard open angle: outdoor ambient temp. $\geq 50^{\circ}\text{F}$, pulse (E); outdoor ambient temp. $< 50^{\circ}\text{F}$, 210 pulse (E).

E: In order to cooperate the compressor discharging temp. over high protection, the system will enlarge the EEV open angle. Within 5 minutes after compressor starts up, it will not modify. The detecting period is 30 seconds.

Cooling mode	Indoor modification angle
$212^{\circ}\text{F} < \text{discharging temp.}$	+50 degree/30seconds, it will stop until up to the max. permitted opening angle
$194^{\circ}\text{F} < \text{discharging temp.} \leq 212^{\circ}\text{F}$	EEV hold control
$\leq 194^{\circ}\text{F}$	-5 degree/30seconds, and reduce to 0 degree gradually
Heating mode	Indoor modification angle
$212^{\circ}\text{F} < \text{discharging temp.}$	+50 degree/30seconds, it will stop until up to the max. permitted opening angle
$212^{\circ}\text{F} < \text{discharging temp.} \leq 212^{\circ}\text{F}$	Keep the angle
$\leq 194^{\circ}\text{F}$	-5 degree/30seconds, and reduce to 0 degree gradually

9.2.3 4-way valve control in heating

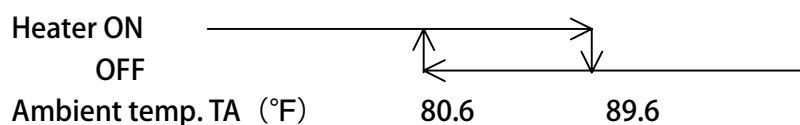
Protection when 4-way valve can not reverse in heating: 10 minutes later after compressor startup, if indoor coil average temp. is below 59°F and keeps for 1 minute, the unit will stop and occur the 4-way valve protection.



9.2.4 Electric heater control

If compressor has not run for a long time, the refrigerant will remain on the bottom of compressor and mix with the refrigerant oil. When re-startup, because low pressure reduces, refrigerant will be migrated from the refrigerant oil and cause foam in the oil, this can cause oil be pumped out of compressor. Therefore please stop heating the compressor bottom to ensure the low pressure in startup period should not go down greatly.

- Ambient temp. $TA \leq 80.6^{\circ}\text{F}$, when compressor stops, the electric heater will be electrified.
- When $TA \geq 89.6^{\circ}\text{F}$, or compressor running, the electric heater will be off.



3.2.5 Control of defrosting in heating

In heating mode, defrosting temp. sensor will check the frosting condition of outdoor heat exchanger and make defrosting control.

A: Enter condition:

a. In heating mode, if the compressor has run for 10 minutes continuously and run for 45 minutes in all, the system will measure the defrosting temperature sensor T_e and outdoor ambient temp. sensor TA , if the below condition can be met for continuous 5 minutes, the unit will enter defrosting operation:

$$T_e \leq C \times TA - \alpha$$

Herein: $C: TA < 32^{\circ}\text{F} = 0.8$ $TA \geq 32^{\circ}\text{F}$, $C = 0.6$

According to SW5-2, the setting is as follow: in the place easy to frost, it is H; when out of factory, it is M.

Jumper selection	M(out of factory)	H
$\alpha(^{\circ}\text{F})$	8(E)	6(E)

b. Defrosting entering condition: $5^{\circ}\text{F} \leq C \times TA - \alpha \leq 28.4^{\circ}\text{F}$;

c. Stop and Pause condition of compressor running accumulative time in heating mode:

Checking Stop: running operation changes from heating to cooling.

Checking Pause: thermostat OFF, or the unit stops.

Cancel condition:

It will take the max. 10 minutes from beginning defrosting to quit it. T_e sensor will measure the condition of outdoor heat exchanger, if the temp. is over 44.6°F for 60 seconds in all or is up to 53.6°F for 30 seconds in all, the defrosting will be over.

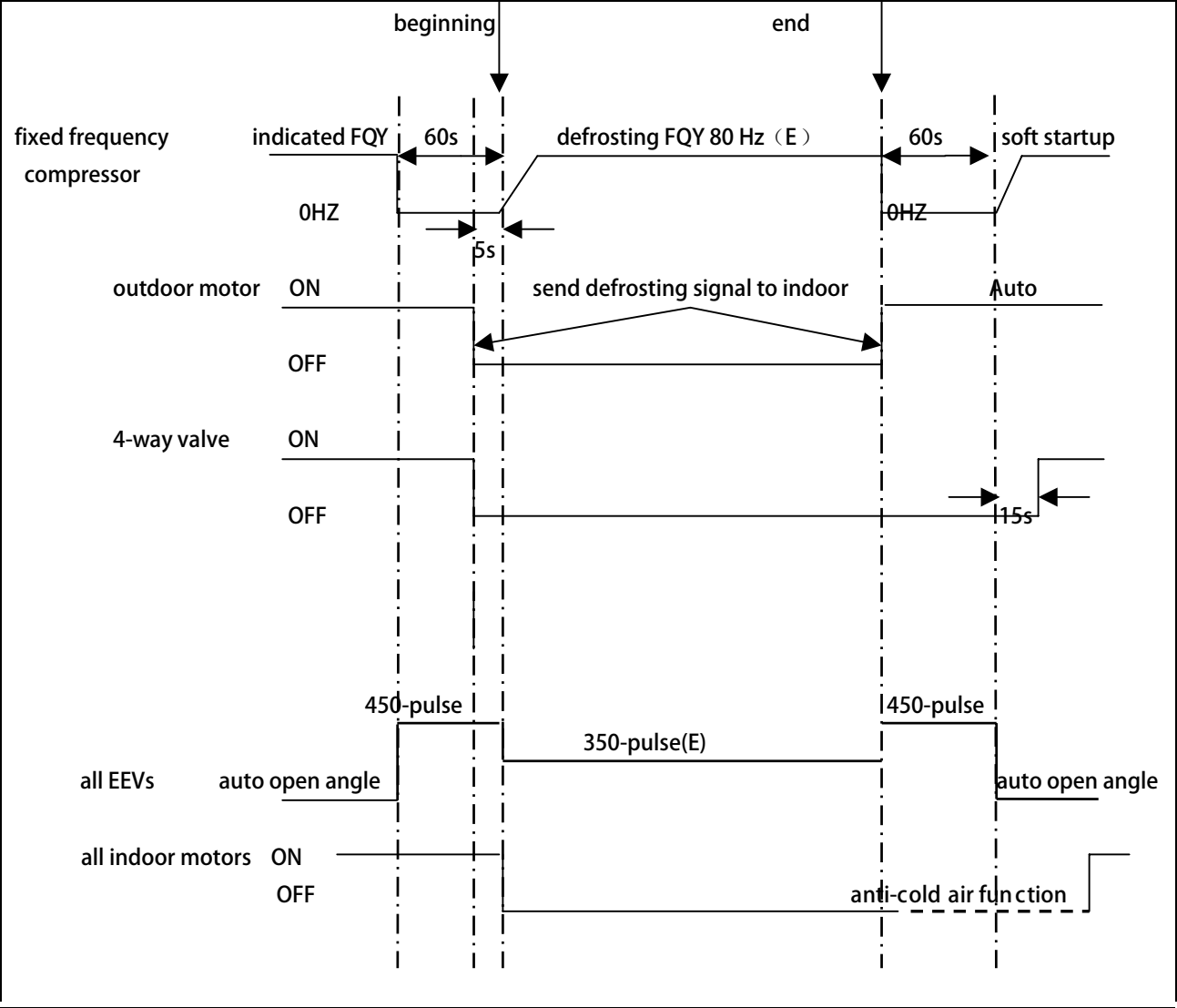
9.2.5 Compulsory defrosting control

Enter condition: in heating mode, after receiving the compulsory defrosting signal from indoor unit, the unit will perform the compulsory defrosting operation.

Cancel condition: $T_e \geq 53.6^{\circ}\text{F}$ and keep for 1 minute or the defrosting time is over 10 minutes. The manual defrosting signal of indoor unit will remain until the outdoor enters defrosting mode.

Note: When outdoor compressor not running, the unit still can enter manual defrosting, but it will comply with the 3-minute protection of compressor.

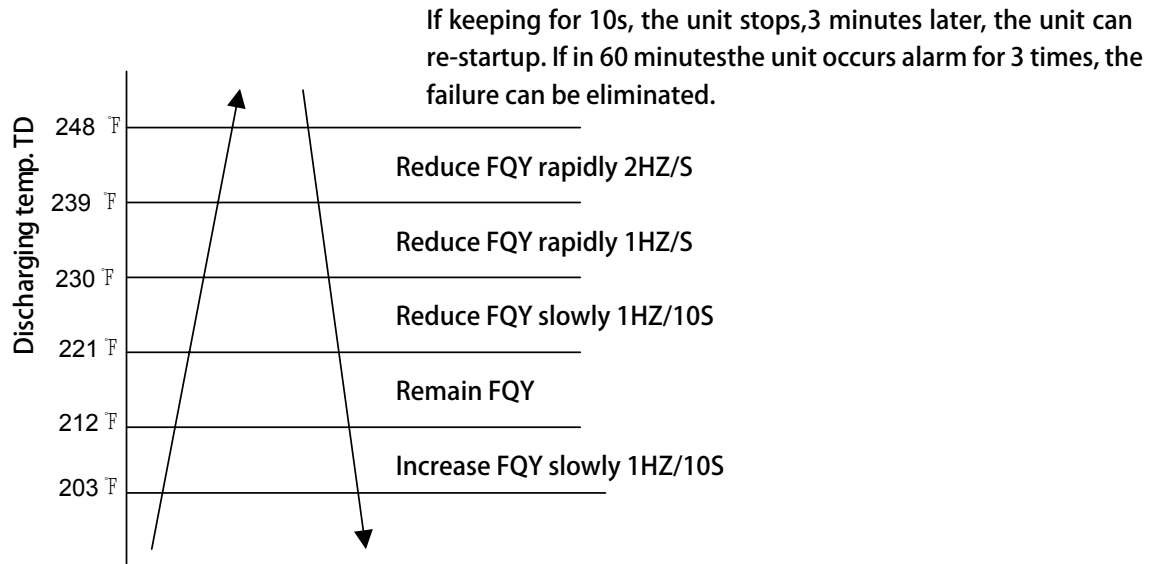
9.2.6 Defrosting operation flow chart:



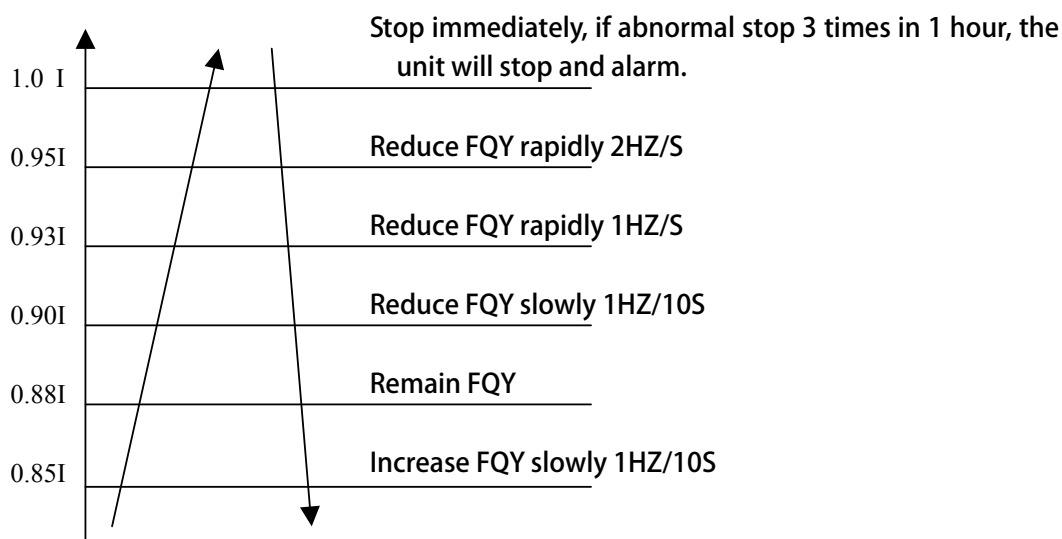
9.2.7 Frequency control when compressor discharge temp. (Td) is too high

Purpose: make compressor frequency control if the discharging temp. is too high, to lower the discharging temp. efficiently and ensure the system can run normally.

Multi:



9.2.8. Frequency control when there is CT over current protection

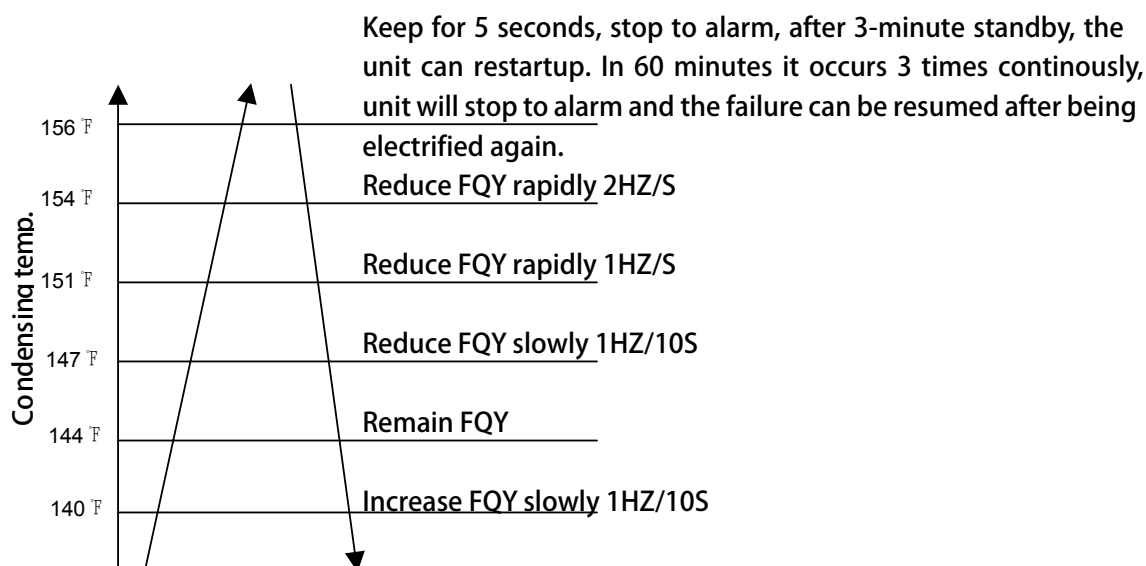


9.2.9. High pressure protection

When the input signal of pressure switch is high level:1, that shows there is no protection.

When the input signal of pressure switch is low level: 0 for 1 minute, that shows high pressure protection works. At this time, compressor stops, outdoor will send the alarm signal. The alarm can be resumable. If in 60 minutes, the failure occurs 3 times, the failure can be confirmed and send failure code to indoor. Meanwhile, by controlling the max. condensating temp. T_c (cooling) or module temp. sensor (T_{mAVE}), please confirm as follow

In nominal cooling/dry/heating mode, high pressure can be controlled by limiting the max. frequency.



9.2.10. Low pressure protection (Multi)

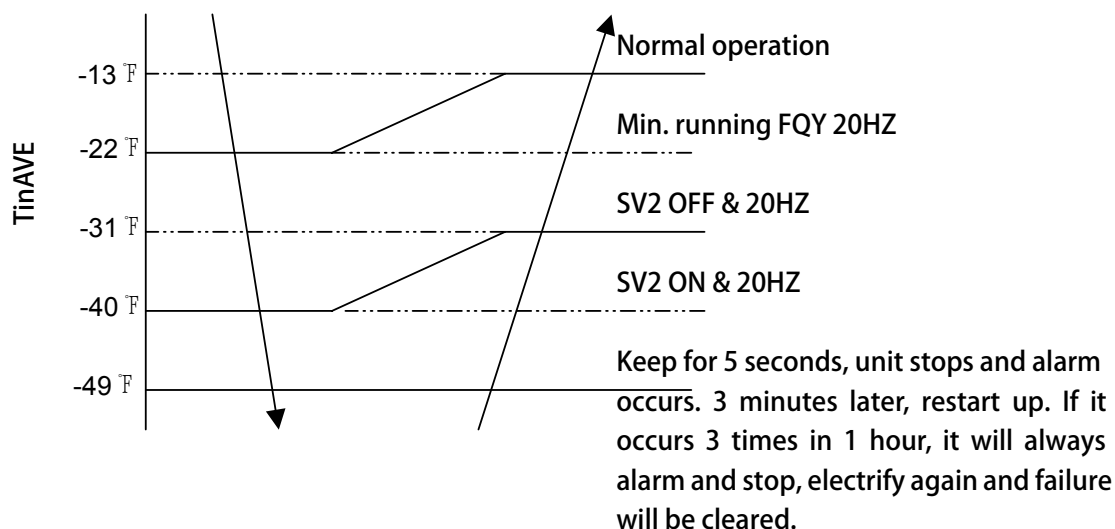
(1) When compressor is running, if output signal of low pressure switch is low level: 0 for 1 minute continuously, compressor will stop, outdoor alarms. The alarm can be resumable. If in 60 minutes, the failure occurs 3 times, the failure can be confirmed and send failure code to indoor.

(2) When compressor no running, if output signal of low pressure switch is low level: 0 for 30 seconds continuously, alarm will occur.

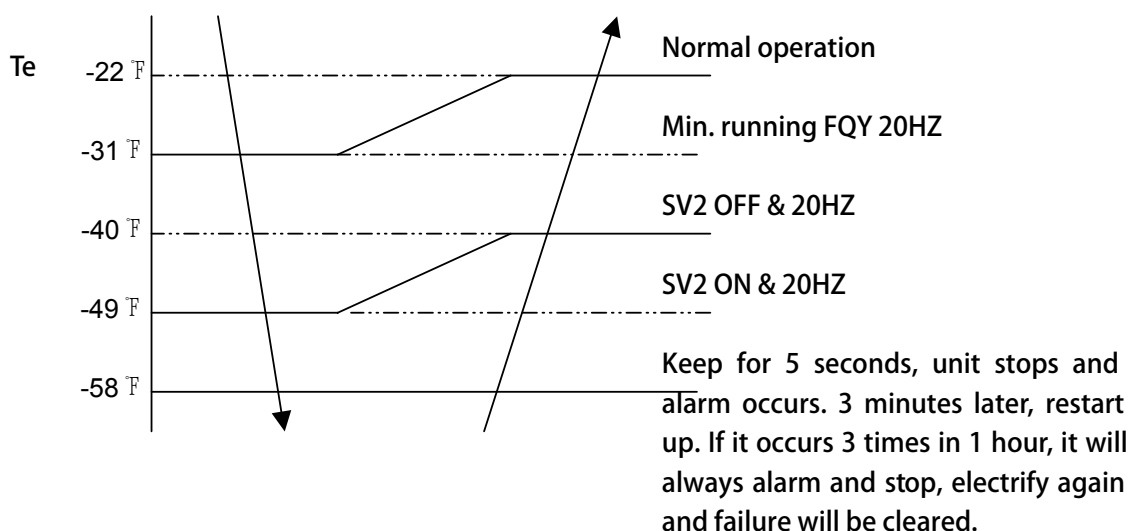
- When unit stops, the reason that system still checks the low pressure : in a long time stop, make protection for the compressor on the condition of great refrigerant leakage.
 - The reason that low pressure switch action time is 30 seconds: when compressor stops, low pressure does not change, so it will be shorter than the set time in operation.
- (3) When compressor starts up, in 8 minutes, low pressure switch signal will be shielded.
- (4) In defrosting, low pressure switch will be shielded.
- (5) In oil return procedure, low pressure switch will be shielded.
- (6) In the refrigerant discharging procedure after the oil return in cooling is over, low pressure switch will be shielded.

In addition, the system will control low pressure through the evaporator temp T_e to realize the low pressure protection function.

In cooling, confirm through T_{inAVE} :



In heating, confirm through defrosting temp. T_e :



If the failure is not confirmed as the permanent protection, outdoor will not send failure code to indoor, and indoor will not alarm.

10. Diagnostic code

3U24GS1ERE 4U36HS1ERE

PRODUCT DIAGNOSIS PROCEDURE				Diagnosis using the Numeral Light Indicator																															
Malfunction Code	Diagnosis	Malfunction Code	Diagnosis	Precautions For Adding Refrigerant																															
1	Faulty of outdoor unit EEPROM	33	Malfunction of gas pipe temp. sensor for indoor unit B	<p>1.This system must use refrigerant R410A.</p> <p>2.Add refrigerant 20g per meter when the total piping length exceeds the standard value,but make sure that the total liquid piping length should be less than the max value.</p>																															
2	IPM overcurrent or short circuit	34	Malfunction of gas pipe temp. sensor for indoor unit C																																
4	Communication failure between Module and ECU	35	Malfunction of gas pipe temp. sensor for indoor unit D																																
5	Module operated overload	36	Malfunction of gas pipe temp. sensor for indoor unit E																																
6	Module low or high voltage	38	Malfunction of module temp.sensor Momentary power failure detection																																
8	Discharging temperature overheating.Lack of refrigerant, ambient temperature too high or PMVs blocked.	39	Malfunction of condensing temp. sensor																																
9	Malfunction of the DC fan motor	40	Malfunction of liquid pipe temp. sensor for indoor unit E																																
10	Malfunction of defrosting temp. sensor	41	Malfunction of 'Toci' temp. sensor																																
11	Malfunction of compressor suction temp. sensor	42	System high pressure switch off																																
12	Malfunction of ambient temp. sensor	43	System low pressure switch off																																
13	Malfunction of compressor discharge temp. sensor	44	System high pressure protection.Refrigerant overabundance,High condensing temp. or malfunction of fan motor.																																
15	Communication failure between indoor&outdoor unit	45	System low pressure protection.Refrigerant shortage, Low defrosting temp., or malfunction of fan motor.																																
16	Lack of refrigerant or discharging			<p>Notes:</p> <p>1.When using this product,you need not to set the address.But the L/N wires between indoor & outdoor units must be corresponded,or there will be communication failure.</p> <p>2.Quiet Operation Setting.Set the DIP "8" to ON position of SW5,the system will run with lower noise,but the max capacity will also reduce slightly.</p> <p>3.Do NOT change the settings of other switches,wrong settings can make the system damage or other malfunctions.</p> <p>4.For some malfunctions, this system can make back up running.</p> <p>* ECU:Electronic Control Unit</p> <p>* MCU:Micro Control Unit</p> <p>* PMV:Pulse Modulated Valve</p>																															
17	4-way valve switching failure																																		
18	Loss of synchronism detection																																		
20	Indoor thermal overload																																		
21	Indoor frosted																																		
23	Module thermal overload																																		
24	Compressor start failure																																		
25	Module input overcurrent																																		
26	MCU reset																																		
27	Module input current detect circuit malfunction																																		
28	Malfunction of liquid pipe temp. sensor for indoor unit A			<p>Definition of SW1 on Malfunction Display</p> <table><tr><th>1</th><th>2</th><th>3</th><th>4</th><th>Definition</th></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>State when out of factory (Normal Operating)</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>Compulsive Heating;Frequency 50Hz; PMV 200 pulse;Class 5 of outdoor fan motor.</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>Compulsive Cooling;Frequency 60Hz; PMV 200 pulse;Class 7 of outdoor fan motor.</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>Rated Operating</td></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>Time Defrost Valid</td></tr></table>		1	2	3	4	Definition	OFF	OFF	OFF	OFF	State when out of factory (Normal Operating)	ON	OFF	OFF	OFF	Compulsive Heating;Frequency 50Hz; PMV 200 pulse;Class 5 of outdoor fan motor.	OFF	ON	OFF	OFF	Compulsive Cooling;Frequency 60Hz; PMV 200 pulse;Class 7 of outdoor fan motor.	OFF	OFF	ON	OFF	Rated Operating	OFF	OFF	OFF	ON	Time Defrost Valid
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OFF	OFF	ON	OFF			Rated Operating																													
OFF	OFF	OFF	ON	Time Defrost Valid																															
29	Malfunction of liquid pipe temp. sensor for indoor unit B																																		
30	Malfunction of liquid pipe temp. sensor for indoor unit C																																		
31	Malfunction of liquid pipe temp. sensor for indoor unit D																																		
32	Malfunction of gas pipe temp. sensor for indoor unit A																																		

0150514354

Notes:

- When using this product, you need not to set the address. But the L/N wires between indoor & outdoor units must be corresponded, or there will be communication failure.
- Quiet Operation Setting. Set the DIP "g" to ON position of SW5, the system will run with lower noise, but the max capacity will also reduce slightly.
- Do NOT change the settings of other switches, wrong settings can make the system damage or other malfunctions.
- For some malfunctions, this system can make back up running.

* ECU: Electronic Control Unit
* MCU: Micro Control Unit
* PMV: Pulse Modulated Valve

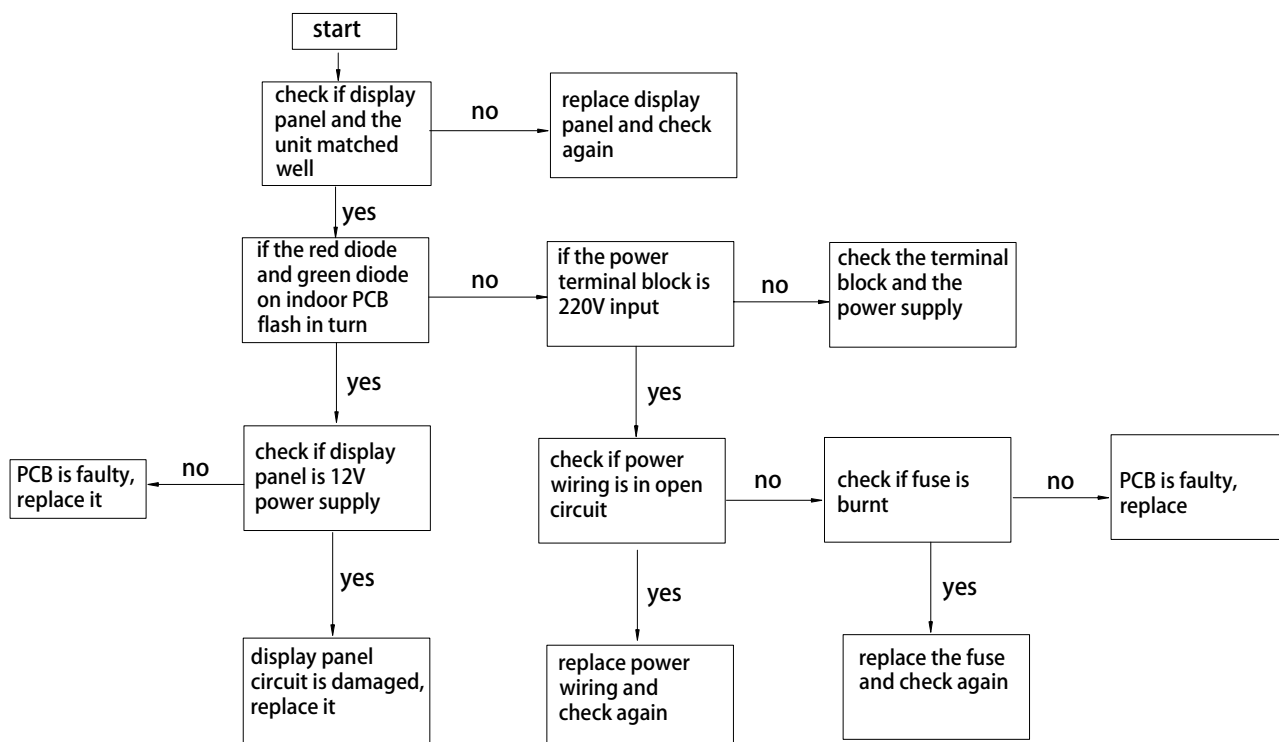
Definition of SW1 on Malfunction Display

1	2	3	4	Definition
OFF	OFF	OFF	OFF	State when out of factory (Normal Operating)
ON	OFF	OFF	OFF	Compulsive Heating: Frequency 50HZ; PMV 200 pulse; Class 5 of outdoor fan motor.
OFF	ON	OFF	OFF	Compulsive Cooling: Frequency 60HZ; PMV 200 pulse; Class 7 of outdoor fan motor.
OFF	OFF	ON	OFF	Rated Operating
OFF	OFF	OFF	ON	Time Defrost Valid

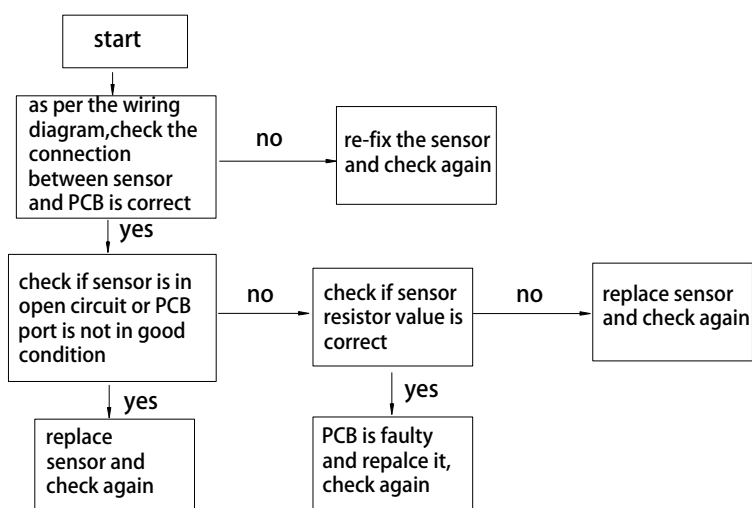
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11. Trouble shooting

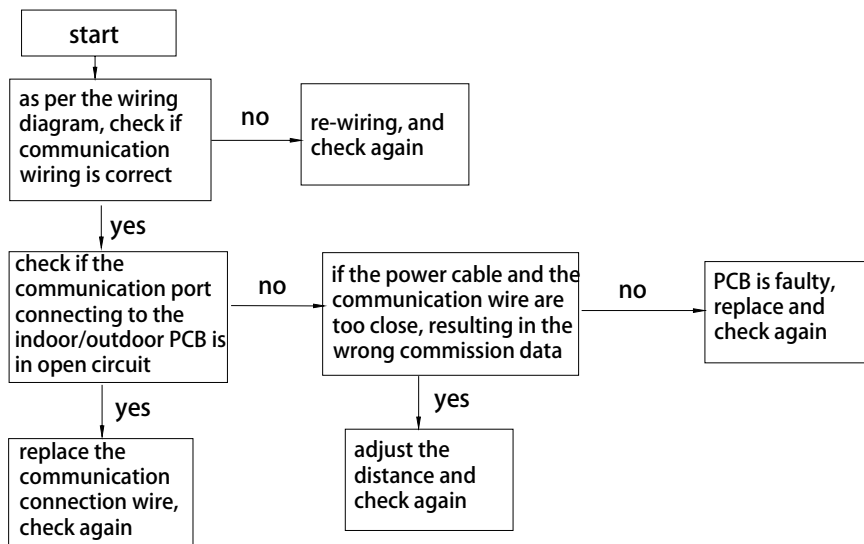
Trouble 1: No display on the operation panel



Trouble 2: Sensor failure



Trouble 3: Communication failure between indoor and outdoor



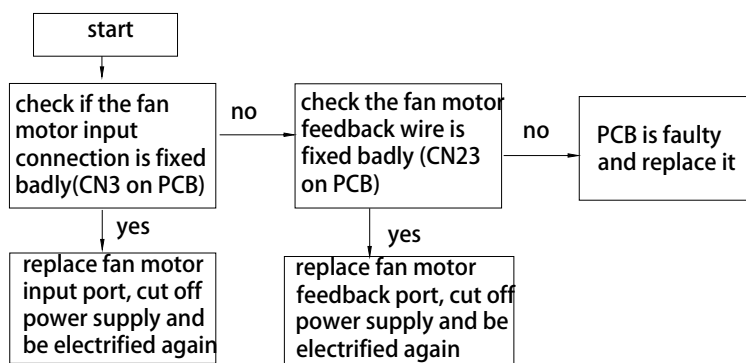
Trouble 4: Indoor PCB EEPROM data is wrong

- 1.If the failure occurs when being electrified for the first time, that shows EEPROM (8-bit pin) not fixed firmly or damaged.
- 2.If the failure occurs when running, that shows EEPROM is faulty and need to be replaced.

Trouble 5: Indoor repeated unit number

- 1.Firstly query the unit number: switch off the unit, press SLEEP for about 15 seconds until the buzzer sounds 5 times, on the display panel there will be digit, which is indoor number. By this method, you can check if there is repeated unit number, if yes, please re-set the number as per the unit number setting procedure.
- 2.Re-set the unit number directly, the unit with outdoor pipe A is No. 1; the unit with outdoor pipe B is No. 2; the unit with pipe C is No.3

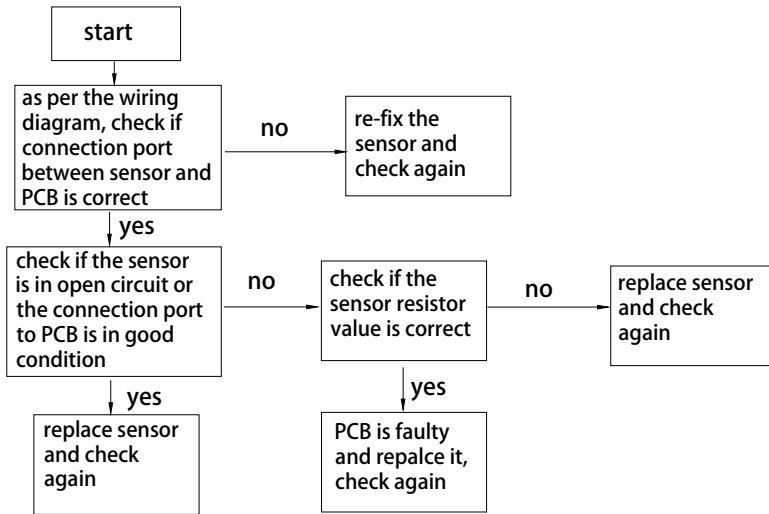
Trouble 6: Indoor fan motor failure, AC fan motor has not 50Hz zero-crossing detection



Trouble 7: Outdoor unit failure

Check the failure code on outdoor indicator board (5-lamp)

Trouble 8: Outdoor unit alarms sensor failure



Trouble 9: AC current over current protection or current transducer damaged, or compressor blocked rotor, compressor great vibration, compressor abnormal startup, state detecting circuit abnormal or compressor damaged.

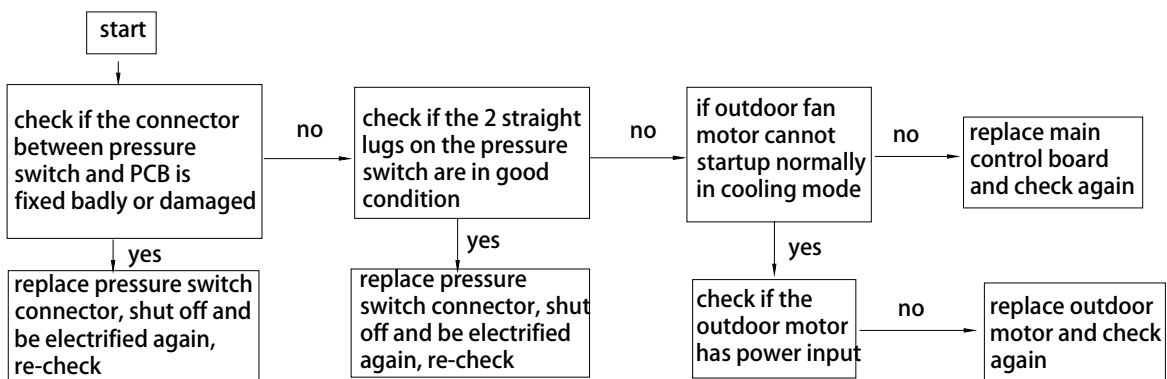
The former twice failure can be resumed automatically, if outdoor board occurs this failure always, and can not be resumed for a long time, that shows:

1. Power module (SPDU) damaged, please replace the power module, then re-wiring as per the wiring diagram (70% possibility)
2. Short circuit in power board results in the power module damaged (15 % possibility)
3. Damaged compressor results in this failure (10 % possibility)
4. Main control board is faulty, replace it (5 % possibility)

Trouble 10: High pressure failure

Reasons:

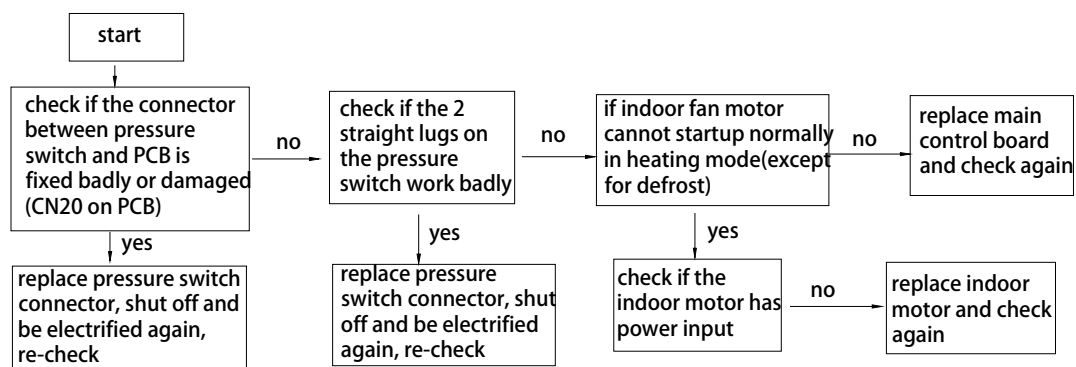
1. Over high system pressure results that the unit stop, and the compressor protection will work. The failure can be resumed.
2. Pressure switch wire is not fixed well or in open circuit.



Failure 11: Low pressure switch failure

Reason: 1. Too low system pressure causes that the unit stops and the compressor protection works, the failure can be resumed.

2. Pressure switch wire is not fixed well or in open circuit.



Appendix Sensor characteristic

Model	Function	Part code	Characteristic
3U24GS1ERE 4U36HS1ERE	gas liquid sensot	10452099	R77=10K Ω ±3% B25/50=3700K±3%
	Oil temp.sensor	10451305	R77=10K Ω ±3% B25/50=3700K±3%
	Defrost temperature sensor	10450194	R77=10K Ω ±3% B25/50=3700K±3%
	power module temp.sensor	10452082	R122=17K±2% B25/50=4170K±3%

R77=10K Ω \pm 3% B25/50=3700K \pm 3%							
T(°F)	Rnom(K Ω)	T(°F)	Rnom(K Ω)	T(°F)	Rnom(K Ω)	T(°F)	Rnom(K Ω)
-4.0	90.79	42.8	23.27	87.8	7.83	132.8	3.11
-2.2	85.72	44.6	22.2	89.6	7.52	134.6	3.11
-0.4	80.96	46.4	21.18	91.4	7.23	136.4	2.9
1.4	76.51	48.2	20.21	93.2	6.95	138.2	2.81
3.2	72.33	50.0	19.3	95.0	6.68	140.0	2.72
5.0	68.41	51.8	18.43	96.8	5.43	141.8	2.63
6.8	64.73	53.6	17.61	98.6	5.6	143.6	2.54
8.6	61.27	55.4	16.83	100.4	5.59	145.4	2.49
10.4	58.02	57.2	16.09	102.2	5.73	147.2	2.38
12.2	54.97	59.0	15.38	104.0	5.52	149.0	2.3
14.0	52.1	60.8	14.71	105.8	5.32	150.8	2.23
15.8	49.4	62.6	14.08	107.6	5.12	152.6	2.16
17.6	46.86	64.4	13.48	109.4	4.93	154.4	2.09
19.4	44.46	66.2	12.9	111.2	4.9	156.2	2.03
21.2	42.21	68.0	12.36	113.0	4.58	158.0	1.96
23.0	40.08	69.8	11.84	114.8	4.42	159.8	1.9
24.8	38.08	71.6	11.34	116.6	4.26	161.6	1.85
26.6	36.19	73.4	10.87	118.4	4.11	163.4	1.79
28.4	34.41	75.2	10.43	120.2	3.97	165.2	1.73
30.2	32.73	77.0	10	122.0	3.83	167.0	1.68
32.0	31.14	78.8	9.59	123.8	3.7	168.8	1.63
33.8	29.64	80.6	9.21	125.6	3.57	170.6	1.58
35.6	28.22	82.4	8.84	127.4	3.45	172.4	1.54
37.4	26.4	84.2	8.48	129.2	3.33	174.2	1.49
39.2	25.61	86.0	8.15	131.0	3.22	176.0	1.45
41.0	24.41						

R122=17K±2%B25/50=4170K±3%							
T(°F)	Rnom(KΩ)	T(°F)	Rnom(KΩ)	T(°F)	Rnom(KΩ)	T(°F)	Rnom(KΩ)
14.0	320.02	80.6	45.60	147.2	9.96	213.8	2.94
15.8	301.43	82.4	43.55	149	9.60	215.6	2.85
17.6	284.05	84.2	41.60	150.8	9.26	217.4	2.77
19.4	267.80	86	39.75	152.6	8.93	219.2	2.69
21.2	252.58	87.8	38.00	154.4	8.62	221	2.61
23.0	238.33	89.6	36.33	156.2	8.32	222.8	2.54
24.8	224.99	91.4	34.75	158	8.03	224.6	2.47
26.6	212.48	93.2	33.25	159.8	7.75	226.4	2.40
28.4	200.75	95	31.82	161.6	7.48	228.2	2.33
30.2	189.75	96.8	30.46	163.4	7.23	230	2.26
32.0	179.42	98.6	29.16	165.2	6.98	231.8	2.20
33.8	169.73	100.4	27.93	167	6.74	233.6	2.14
35.6	160.62	102.2	26.76	168.8	6.52	235.4	2.08
37.4	152.07	104	25.65	170.6	6.30	237.2	2.02
39.2	144.02	105.8	24.58	172.4	6.09	239	1.97
41.0	136.46	107.6	23.57	174.2	5.89	240.8	1.91
42.8	129.34	109.4	22.61	176	5.69	242.6	1.86
44.6	122.64	111.2	21.69	177.8	5.51	244.4	1.81
46.4	116.33	113	20.81	179.6	5.33	246.2	1.76
48.2	110.39	114.8	19.98	181.4	5.16	248	1.72
50.0	104.79	116.6	19.18	183.2	4.99	249.8	1.67
51.8	99.51	118.4	18.42	185	4.83	251.6	1.63
53.6	94.53	120.2	17.69	186.8	4.68	253.4	1.58
55.4	89.83	122	17.00	188.6	4.53	255.2	1.54
57.2	85.40	123.8	16.34	190.4	4.39	257	1.50
59.0	81.21	125.6	15.71	192.2	4.25	258.8	1.46
60.8	77.25	127.4	15.10	194	4.12	260.6	1.43
62.6	73.52	129.2	14.52	195.8	3.99	262.4	1.39
64.4	69.98	131	13.97	197.6	3.87	264.2	1.35
66.2	66.64	132.8	13.44	199.4	3.75	266	1.32
68.0	63.48	134.6	12.94	201.2	3.63	267.8	1.29
69.8	60.49	136.4	12.46	203	3.52	269.6	1.25
71.6	57.66	138.2	11.99	204.8	3.42	271.4	1.22
73.4	54.98	140	11.55	206.6	3.31	273.2	1.19
75.2	52.44	141.8	11.13	208.4	3.21		
77.0	50.04	143.6	10.72	210.2	3.12		
78.8	47.76	145.4	10.33	212	3.03		